ADVISORY

DEPARTMENT OF THE IMPERIAL COLLEGE

OF TROPICAL AGRICULTURE.

IMPERIAL MYCOLOGICAL
16 AUG. 1933
INSTITUTE

REPORT

ON THE

AGRICULTURAL DEPARTMENT,

ST. LUCIA,

1932.

ISSUED BY THE COMMISSIONER OF AGRICULTURE

[Price Sixpence.]

PRINTED BY THE GOVERNMENT PRINTER AT THE GOVERNMENT PRINTING OFFICE,
CASTRIES, ST. LUCIA.

1933.

FORWARDING DISEASED SPECIMENS FOR EXAMINATION.

PLANTS.

A few fragments of a diseased plant are of practically no value for scientific investigation. Sufficient material should always be sent so that the primary cause of the trouble may be located.

Full particulars should be given as to the nature and extent of the damage *done*, the part of the plant attacked, the nature of the soil, drainage, the prevalence of the disease, when it was first noticed, and whether any similar kind of disease has previously been observed in the neighbourhood.

Specimens of portions of plants attacked by fungi may be sent green, packed in a well-ventilated box if the time taken for delivery is under 24 hours, but if delivery takes a longer time, all leaves or soft fruits should be placed in a bottle or corked tube containing a solution made of one part rum or methylated spirit, and two parts water. As many stages of the disease as possible should be sent, with notes as to the nature of each stage.

All specimens should be accompanied by detailed particulars of the nature of the disease, and shall be addressed to :—

THE AGRICULTURAL DEPARTMENT,
CASTRIES.

INSECTS.

Observations and specimens of economic importance or otherwise will always be gladly received. The following directions should be observed in this respect :—

Living insects should be packed with a supply of the plant on which they are found feeding and the box should have some small holes pierced for the purposes of ventilation. These should be carefully packed in such a way as to prevent their becoming crushed in transit.

If it is desired to preserve specimens they should be put up in bottles with tightly fitting corks. Methylated spirits, diluted rum, etc., make excellent preserving fluids.

Scale insects, etc., should be forwarded on the portion of the plant on which they are found.

If in doubt as to the best method of forwarding specimens, a letter should be sent asking for instructions and stating full details.

In all cases full particulars should be forwarded as to the nature and extent of damage done, along with any other important points that may have been noticed.

All specimens should be addressed to :—

THE AGRICULTURAL DEPARTMENT,
CASTRIES.

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1933.

LETTER OF TRANSMITTAL.

31st March, 1933.

Sir,

I have the honour to transmit herewith the report by the Agricultural Superintendent on the working of the Agricultural Department, St. Lucia, for the year ended 31st December, 1932.

2. The very unsatisfactory conditions existing at the Botanic Gardens, Castries, are again referred to with the suggestion that these Gardens should be taken over by the Town of Castries as a park or recreation ground and the Agricultural Department relieved of the responsibility and expense of their upkeep.

3. The conditions in the Gardens make it impossible to maintain a representative Botanic Garden, and under present circumstances the Gardens play no important part in the agricultural work or prospects of the Colony.

4. The Agricultural Department is fully occupied with its Agricultural work and might with advantage be relieved of the responsibility of maintenance of the grounds. The Department should be available for advice when required in connection with these grounds as in the case of other public parks and recreation grounds.

5. The development of the fruit and vegetable trade continues to be satisfactory. The total value of the exports in 1932 of fruits and vegetables, amounting to £10,175 is very slightly in excess of that of the previous year.

6. The work of converting mango and citrus trees by top-working is giving good results and should result in a few years in an appreciable increase in the quantity of improved fruits from trees which were worthless in the export trade of these fruits. The trials of grafting of mangoes appear to have been successful.

7. The year under review completes a period of 24 years since the beginning of the teaching of agriculture in the primary schools and since the lectures to primary teachers in St. Lucia was undertaken by the Agricultural Department. There can be no doubt that this is an effort of education in the right direction. There can also be no doubt that results of such work should be evident and it would be of much interest if a report or statement could be prepared indicating whether or not the peasantry for whom this very considerable effort on the part of Agricultural Officers has been made has benefited or in what way the Agriculture of the Colony has been improved in consequence of their work. The Agricultural Instructor has been in contact with the peasantry during this period and his work may be considered a continuation of the instructions given in the schools. This combined effort should have produced tangible results, and the situation should be analysed. Are the peasants more contented as agriculturists, more efficient in their farming, better labourers and more satisfactory to their employers than they would probably have been without the opportunities they have enjoyed?

8. The addition of the Agricultural Assistant has greatly strengthened the staff of the Department and make possible a good use of the grant of £2,000 for the intensive programme of citrus propagation over the two-year period, and of the grant of £100 per annum over a three-year period for the propagation for planting material for the peasantry.

9. The report is a record of a very considerable amount of work done, and indicates good prospects of developments in the near future.

I have, &c.,

H. A. BALLOU,
Commissioner of Agriculture.
Imperial College of Tropical Agriculture.

His Honour
The Administrator,
St. Lucia, B.W.I.

STAFF OF THE AGRICULTURAL DEPARTMENT, ST. LUCIA.

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Government Marketing Depot.

J. R L. Johnson	Manager & Fruit Inspector.
Julius F. Girard	Clerk & Chief Packer

* To 31st May, 1932. † From 1st June, 1932. ‡ To 30th September, 1932.

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SAINT LUCIA.

Report on the Agricultural Department for the year ended December 31, 1932.

WORK IN THE BOTANIC GARDENS, AND OBSERVATIONS ON PLANTS.

The Botanic Gardens were maintained in fair condition throughout the year although drainage was much hampered by heavy rains and high tides. Flooding took place in October and November, and to a less extent in June which was unusually wet. Consequently the lawns have suffered and constant work has been needed on the drains and road repairs. The introduced Java grass (*Polytrias praemorsa*) has withstood the effects of wet weather better than the local grass mixtures, which are also more subject to destruction by land crabs.

The main road and paths have been rebuilt with road metal and binding grit, and repairs to culverts, gates and benches have been carried out.

To assist in more permanent reclamation and binding of the soil, the banks of the principal canals and drains have been planted with Casuarina, and these trees have made excellent growth. The beds and borders have been maintained in hard-wooded ornamentals such as Crotons, Hibiscus and Poincettia, and propagation of the usual plants and seeds has been continued. A supply of crotons and palm plants in tin containers was provided for the Canadian National Steamships, and attention was given to the ornamental planting of Columbus Square.

As a measure of economy it is proposed to carry out ornamental propagation at Union Experiment Station in future, thus removing the need for a special staff for this purpose at the Botanic Gardens. Plant deliveries and fumigatorium work will be arranged for by the use of the nursery only, and the remainder of the Gardens can then be utilised for other public purposes if found desirable. Being but a few feet above tide level, the site is an unsatisfactory one for a plant collection, and without the expenditure of a fair sum of money on drainage and raising the land, it cannot be maintained as a creditable Botanic Garden; it would be better if classed as a public park and recreation ground. In view of the continued need for economy, it is most unlikely that extra funds will be found for any other purpose but that of establishment and extension of the more important economic crops, and the condition of the Gardens will then reflect little credit on the Agricultural Department. It has therefore been recommended that other uses be found for this property. Should this be not agreed to, the necessary steps will be taken to maintain a minimum staff in charge of drainage and upkeep of the existing plant collections.

PLANT AND SEED INTRODUCTION.

The undermentioned seeds and plants were presented to the Department and are gratefully acknowledged :—

A collection of seeds including *Callistemon citrinus*, *Carica papaya*—

" Mme. Russell " and " Solo " vars., and *Aleurites fordii*, presented by the United States Department of Agriculture ; a collection by Professor Juan Balme, Mexico, including *Tabebuia guayacan*, Hem., *Cosmos bipinnatus*, Cav., *Ferocactus latispinus*, *Cassia tomentosa*, L., *Ipomea coerulea*, L., and *Ipomea arborescens*, Don. ; Sowari nut (*Caryocar nuciferum*) ; Jackfruit, and Avocado pear budwood presented by Dr. Fairchild ; Tonka beans (*Dipteryx odorata*) by the Department of Agriculture, Trinidad ; Cane cuttings var. B 2935 by the Department of Agriculture, Barbados, and var. B 4507 by the Agricultural Department, Antigua ; *Khaya ivorensis* and *Entandrophragma macrophyllum* by the Department of Agriculture, Nigeria ; Talipot palm seeds by the Agricultural Department, Ceylon ; and a collection of vegetable seeds by the D. Landreth Seed Co., U.S.A., for trial.

In addition, supplies of vegetable seeds were purchased for retailing to planters.

PLANT PROPAGATION AND PLANT DISTRIBUTION.

The propagation service was active during the year mainly in the direction of seedling, budded and grafted limes, of which larger numbers were distributed than for the previous year, as shown below :—

Plants, Seeds and Cuttings distributed by the Agricultural Department during the five-year period 1928—1932.

	1928.	1929.	1930.	1931.	1932.
Lime seedlings	3,870	19,661	14,585	7,687	13,725
Budded and grafted limes	64	312	2,467	296	2,019
Sour orange seedlings	...	...	1,110	8,405	3,200
Budded oranges	251	306	582	512	596
Budded grapefruit	30	235	521	1,265	1,489
Budded lemons	...	...	86	392	67
Grafted mangoes	118	138	116	102	69
Grafted avocados	4	256	158	123	22
Pineapple plants	812	1,253	81	5,012	1,788
Coffee plants	...	55,150	1,665	7,300	140
Coconut plants	46	119	86	...	6
Dwarf coconuts	...	18	33	4	12
Claret nuts	125	22	14	...	11
Kola plants	..	300	...	...	...
Grafted nutmegs	...	62	57	5	...
Papaw plants	2,015	1,690	530	.	...
Total Orchard Plants	7,335	79,522	22,091	31,103	23,144
Cane plants	6,919	72	5,895	39,594	5,949
Sisal plants	...	4,274	...	.	...
Forest plants	761	120	225	1,878	132
Vegetable seedlings	...	2,369	4,287	15,378	3,200
Plantain suckers	...	...	...	...	141
Banana suckers	..	...	...	...	122
Miscellaneous plants and cuttings ...	425	82	150	120	...
Total Economic plants	15,440	86,439	32,648	88,073	32,688
Vegetable seed (lb.)	114	22	18	19	21
Sweet potato cuttings (bundles) ...	...	...	...	5	6
Potato-yam plants (lb.)	..	...	...	..	352
Green dressing seed (lb.)	...	248	160	119	46
Fodder plants and grasses (bundles) ...	.	12	226	55	...
Ornamental plants and cuttings ...	389	780	285	491	486

The distribution of grapefruit and orange plants was not much advanced through lack of budded plants, and efforts were concentrated on the assembly of a large number of stocks for budding, to be issued in 1933. This work was much retarded through scab disease of the sour orange at the Union nurseries, and various methods are being tried to reduce the effects of the disease. Drainage and free manuring in the earlier stages have induced more vigorous flushes of growth and recovery from scab dwarfing, and pruning of diseased parts assists in reducing further attacks. Spraying and shading at the seedling stage of the sour orange is being tried. Certain small-leaved forms of the sour stock appear to be resistant to the disease, and these are being watched with a view to further development, if such resistance should prove constant.

The demand for nursery-grown avocados and mangoes was reduced owing to the success of the topworking campaign, as this method appeals particularly to those possessing "wild" trees of poor fruiting value. The progress of this work is reported under "Peasants Development", but the effort is not confined to peasants, and many large estate holders have been assisted in topworking their wild forms with the useful "Julie" variety.

An important variation in topworking has been introduced through the joint efforts of the propagators working under the direction of the Agricultural Instructor, and this is accordingly detailed under "Note on Graft Method of Topworking Mangoes".

The distribution of plants to small holders has been increased principally in provision crops such as plantains, bananas, yams and sweet potatoes. There was no special effort during the year to grow vegetable seedlings for export crops, little demand being shown apparently owing to wet weather; a larger amount of seed was, however, distributed. A plot of $\frac{1}{2}$-acre of selected vegetables (carrot, onion, cabbage and cucumber) is being prepared in the Soufrière nursery to demonstrate better methods of growing these vegetables, which are still improperly managed by most peasant growers and in consequence give poor returns.

Extension of Nurseries under the Peasants Development Service and Citrus Grants.

Under the Colonial Development Fund, a sum of £100 per annum for three years is available for propagation of plants for peasants, and part of this is being utilised for continuation work on the grafted and budded plants already distributed. Many of these plants are too deeply planted or improperly shaped, and require lifting and pruning; and such educative work is carried out by travelling nurserymen under the Agricultural Officers. The remainder of the sum is used for the establishment of two small nurseries mainly for demonstration purposes under the Agricultural Instructor, where the raising and after-care of orchard trees may be studied by the local planters and small orders can be delivered on the spot. The cultivation of vegetables and supply of seedlings is also attended to. These sub-nurseries form a convenient centre to which smallholders resort for advice and demonstration, and some sound work can be carried out in them for the betterment of present holdings and future orchards. For the past year it has been recognised that the provision of sour orange stocks for budding *in situ* or for planting in smallholders' plots is unsatisfactory through inappreciation of the care needed to produce good trees. Consequently the distribution of seedlings is being discouraged and fully grown budded stocks are being substituted.

During the year a sum of £2,000 was made available for an intensive programme of citrus propagation over a two-year period. The grant originated with the visit to Union of the late Sir Sydney Armitage-Smith as Financial

Adviser, when it was pointed out that slow progress only could be made on local funds, and that the time was ripe for an intensive planting of citrus, followed by proper after-care in order to establish sufficient orchard area to form a fruit industry. The programme prepared was strongly supported and in due course funds were allotted from his Majesty's Treasury; work commenced in March with the opening of the Soufrière (Rabot) Nursery, and extensions at Union Station.

This generous grant allows of sufficient propagation to establish from 800 to 1,000 acres of orchards, at the small issue rate of 3d. per tree. The receipts are to be accumulated to form a fund to provide for after-care of the orchards.

Provided that scab disease of stocks does not assume much greater proportions, it is expected to distribute approximately 24,000 budded plants, mainly grapefruit, during the planting season of 1933. At present the Rabot Nursery is entirely free from scab and presents a most encouraging appearance.

The original nurseries in the Dennery and Soufrière Districts have been closed through scab effects coupled with the intractable nature of the soil, and propagation under the scheme is confined to the Union and Rabot nurseries.

Planters are being urged to take immediate advantage of this fund by ordering sufficient blocks of plants to establish their future orchards, so that later work can be concentrated on promoting these to the fruit bearing stage.

NOTE ON GRAFT METHOD OF TOPWORKING MANGOES.

The method of topworking by budding described recently ("*Plant Propagation, The Propagation of Tropical Orchard Crops at the Union Agricultural Station, St. Lucia*"—"Tropical Agriculture," Vol. IX, No. 2, pp. 35—37) has now been improved by the substitution of grafts for buds. In this method, any suitable tree when cut down may be grafted immediately if desired, thus saving much time. The prepared stump should present a smooth surface free from rough edges or unnecessarily exposed wood. At three to six selected spots on the trunk the edge of the cut bark is lifted by making a cleft about $2\frac{1}{2}$ to 3 inches long downwards from the top of the stump and firmly levering this open to receive the graft. The graft should consist of 6 to 8 inches of second year growth, bearing dark coloured mature leaves, and these are pruned off. The apical buds should be plump but still firm and unbroken in the rosette; the bark should be dark green and mottled in colour, firm and laticiferous; the diameter at the base of the shoot being $\frac{5}{16}$".

The graft should be tapered on one side and is then inserted smoothly between the bark and wood to a depth of 3 inches, and bound with raffia or string; in the larger trees with thick bark no binding is needed, the graft being held in place by pressure of the bark. This is a form of crown or rind-grafting, and is successful on the large stumps.

For grafting on branches or smaller stocks a method of side grafting is used, utilising scions as described above. This is done by opening a T-shaped incision and paring away the upper edge of the horizontal cut to allow a close fitting union. The graft is then inserted smoothly to a depth of 2 to 3 inches and bound up. A successful graft remains green and commences to grow after about seven days; growth is encouraged by retaining a few "wild" shoots or branches to assist in the flow of sap until grafts are in leaf.

Scions are improved by being kept for 4 to 5 days in wet brown paper, when the most suitable ones will be recognised by a tendency to swell, while immature scions will shrink and change colour.

NOTES ON PLOTS ESTABLISHED AT THE AGRICULTURAL STATION, UNION.

Citrus Orchard.

Grapefruit.

The growth of the trees of the "Marsh" variety has been much more rapid than it was in 1931, and this improvement is attributable to removal of the banana shade in the plot, inarching of the weaker trees with sour orange stocks in 1931, and improved drainage. None of these trees fruited this year, owing to the continuous removal of budwood.

The general health and vigour of the "Duncan" variety has also greatly improved from the same causes as above.

The tree of the "Conner's Prolific" variety carried its first crop this year, consisting of 15 fruits which were of fair marketable size, $3\frac{1}{2}$ to 4 inches in diameter (i.e. 112s to 70s). The external appearance and flavour were good, but it is a seeded variety. The "Foster's Pink" variety has made very rapid growth.

The grapefruit trees in this orchard have supplied most of the budwood required for propagation during the year.

Oranges.

These trees continue to make good growth and are fairly large size. One of the Parson Brown variety bore one fruit, which had a good external appearance, but the inside was rather dry and the flavour insipid; it is expected to improve as maturity is reached. The Whitaker tree also fruited in November. The fruits were small for local varieties, but of good trade size, and the flavour was excellent.

Limes.

In this portion of the orchard all the Manila hemp shade was removed and the drainage improved to encourage root activity.

The budded West Indian limes continued to make excellent growth, but suffered from an unusual heavy attack of blossom blight and withertip during March to June which materially reduced the crop prospect.

The Trinidad hybrid limes have been discarded, with the exception of Nos. 1 and 6, which are nearly representative of the West Indian variety, and therefore useful for possible crossing in the future. The vacant places have been replanted with one tangerine plant, five each of Woglum lime No. 29 and No. 55, and two *Citrus aurantifolia* No. 38, the budwood of which was recently introduced from Dominica.

Intercrops and Manures.

A few beds of the "Red Spanish" pineapple obtained from Porto Rico last year have been kept for propagation. The "Sugar Loaf" variety propagated by the section method fruited this year, the fruits being of good size and shape, but rather fibrous. This defect was probably due to lack of organic matter and the retentive condition of the soil.

The remainder of this section was effectively cover-cropped with *Crotalaria sericea* which has seeded freely, and pen manure and bay leaf mulch was applied to all the orchard trees. Eight pounds of a complete mixed fertiliser consisting of sulphate of ammonia, sulphate of potash, and superphosphate, in the proportion of 8 : 5 : 8 was applied to all budwood trees, and four pounds to trees not required for budwood, two equal applications being made in January and June.

Insect pests consisted principally of the purple scale insect (*Lepidosaphes beckii*), and this was effectively controlled by spraying with resin wash with stock dilution 1 : 4 water.

Orchard Section.

The mango trees have made rapid growth and have supplied all the scions for the grafted mangoes distributed. The Graham mango trees set a small crop, the fruit characteristics being the same as last year.

Oranges.

Little budwood was taken from the trees this year and in consequence they have developed well. Three Washington Navel, one each of Pineapple, Temple and Ruby, and two Late Valencia varieties fruited for the first time, the first three maturing in November, and the Ruby and Late Valencia in December. All the fruit were of good shape and size, but of only moderate flavour, the trees being in a vigorous growing condition, with a small crop.

Avocado Pears.

With the exception of one tree each of the varieties Rudder and Nimlioh, the trees have made good growth. The topworked local variety "G.H." carried a fairly heavy crop of fruit of good external appearance, but with little taste. One "Fuerte" flowered heavily in February but set no fruit.

Limes.

The budded West Indian limes and the Woglum limes made excellent growth and the latter carried a good crop of fruit. The Tahiti limes made very slow growth.

The orchard trees of this section received 2 to 4 lb. of a complete fertiliser mixture of sulphate of ammonia, sulphate of potash, and superphosphate in the proportion 6 : 5 : 6, and were mulched with bay leaves; the section was cover-cropped with *C. sericea and C. usaramoensis.* The purple scale on citrus was controlled with resin wash.

Coconut Plot.

The plot of Malayan Dwarf coconuts now contains 25 trees, of which four flowered and five are in crop. Six seedlings were planted this year and others were distributed. The twenty-seven trees in the plot of four local varieties made satisfactory growth.

The cover crops were removed and the land forked and drained prior to being covered with *C. sericea* and *C. usaramo ensis.*

Sugar-Cane Plot.

The sugar-cane varieties in this plot were removed in April and replanted in a new site in order to provide room for the extension of sour orange nurseries, the unused canes being crushed locally and producing 196 gallons of syrup.

The B. 891 variety, recently introduced, made excellent growth in the quarantine plot and a large number of plants have been distributed. Two new varieties, viz. B. 4507 and B. 2935 were introduced, and the former having made satisfactory growth in quarantine will be ready for distribution early next year. The demand is principally for plants of the recently introduced varieties, and a small order for Java varieties.

Budded Lime Experiment Plot.

The purpose of the Lime Experiment Plot is to obtain empirical data on the manurial requirements of limes budded on sour orange under lowland conditions in St. Lucia, and the effect of mulch from lemon grass grown on the plots. Other observations which can be made as the trees progress, e.g. effect of manures on flowering and fruiting under ordinary withertip conditions, periodicity and yields of individuals and the effects of shelter belts, are secondary to the main investigation, that of nutrient requirements, on which

ig. 1

Fig. 2

Fig. 3

Fig 4

Fig. 5

EXPLANATION OF PLATES.

Figure 1. Specimen Budded West Indian Lime on Sour Orange, Manurial Experiment Plot, Union. Normal lime tree, type A.

Figure 2. Specimen Budded West Indian Lime on Sour Orange, Manurial Experiment Plot, Union. Close growing, erect, type B.

Figure 3. Photograph of :—

Budded West Indian Limes on Sour Orange, Manurial Experiment Plot, Union. March 1933.

Figure 4. Budded "Marsh" Grapefruit.

Demonstration Orchards, Union, showing framework and branch distribution.

Figure 5. Malay Dwarf Coconut—Green form. Seed imported 1924, lifted and replanted, present site 1928. 49 nuts.

practically nothing is known for local conditions. The depression of the lime industry has not invalidated this work as it is apparent that St. Lucia can continue to supply oils and green fruits at least, with a probable expansion in view of disease restrictions elsewhere and market recovery.

The layout of the experiment suggested by the Rothamstead Experiment Station staff, Imperial Bureau of Soil Science, has been revised and simplified to meet objections raised by the Field Experiment Committee (Agricultural Conference 1930) Imperial College of Tropical Agriculture, and is now as shown by the attached plate, fig. 3 and briefly outlined as follows—

The area of approximately four acres is divided into sixteen plots consisting of four replications indicated by "A", "B", "C", "D", the order being transposed so that each unit of treatment represented by its letter occurs once only in each strip of four plots, thus forming a Latin square. Each plot contains 28 trees of which the outer ones form guard trees, the inner rows containing eight trees being those used for experimental work.

An initial application of a general manure over the entire area is to be followed by treatments utilising nitrogen, phosphoric acid, potash and nil manures, in addition to mulch. The recommended applications are as here indicated—five tons vegetable mulch applied generally, followed by fertilisers applied in two dressings, viz.,

	1st year.	2nd year.	3rd year.	4th year and subsequent.
Plot A. sulphate of ammonia per tree ...	½ lb.	1 lb.	1½ lb.	2 lb.
Plot B. sulphate of potash per tree ...	in similar applications as above.			
Plot C. superphosphate (17·5% P_2O_5) per tree...	2 lb.	4 lb.	6 lb.	8 lb.
Plot D. Control	no fertilisers; mulch only.			

Lemon grass is to be extended along the drains to provide the permanent mulch cut on the plots, which is an important feature of the trials.

The trees are spaced 25 feet by 16 feet and form shelter rows, to which Gliricidia beds will give added protection, the intervening spaces for the present being cultivated in beds of budding stocks alternatively with green manures in the lime rows.

Planting was carried out in July—August, using classified stocks and scions of equal merit, the budwood being obtained from Reunion No. 6 tree of high yields (page 6 Annual Report, St. Lucia, 1927). Bay leaf mulch was applied to the area (1¼ tons per acre) and subsequently in October ½ lb sulphate of ammonia was worked in around each lime tree. Forty per cent. of the trees flowered in October, and some fruits were set; withertip was very slightly in evidence.

Soil samples from the experiment plots at these depths have been analysed by the Chemistry Department of the College.

The citrus beds have provided all the citrus plants distributed during the year, and four beds containing 13,000 sour orange stocks in all were planted up during June for budding in 1933. Progress in this work has been hampered by scab disease of stocks, despite regular spraying, and shading methods are now being tried.

Withertip Disease Experiment on Budded Limes.

The purpose of this experiment is to obtain information on the conditions conducive to withertip disease, which is caused by the fungus *Gloeosporium limetticolum*, and is prevalent during wet seasons. Apart from rainfall, which cannot be controlled, it is suggested by the experience of the Soufrière lime planters, that humidity induced by "Immortelle" shade is of less destructive importance than the benefits derived from the shelter and organic mulch. Consequently the experiment which approaches estate conditions as far as possible, will include an "Immortelle" shade plot with trees planted 25′ × 16′

provided with irrigation, a no-shade plus irrigation plot, and a no-shade-no-irrigation-control plot. The effect of lemon grass mulch will also be observed.

The area has been drained, laid out in beds, and cropped with sweet potatoes to improve tilth ; the budded limes are being prepared for planting in January—July 1933.

Demonstration Orchards.

The purpose of these orchards is to demonstrate the practical development on proper lines of one acre each of selected fruit trees, at a minimum cost by the intercropping of local vegetables. The cost of all operations is tabulated and carried forward annually, together with receipts.

Plot 1, Orange.

In this plot one Lue Gim Gong tree was lost through being ringed by stinging ants, but in general the trees have made excellent growth, particularly the Temple oranges, most of them having flowered and set fruit, although planted in 1931.

Spraying with resin wash and grease-banding with Ostico was necessary on some trees to control green scale, purple scale, *Thrips* and ants. Bay leaf mulch was applied to all the trees in this plot, and each tree received four pounds of the complete fertiliser previously noted, in two applications in January and June.

The plot was intercropped with yams, sweet potatoes, plantains and black eye peas, as cash crops.

Plot 2, Grapefruit.

In this plot three Marsh trees and one Duncan were unhealthy and suffering from poor root stocks and were replaced by better specimens. The Duncan variety started slower than the Marsh, but there is now little difference between the two varieties and the general growth increment on established trees is very satisfactory.

Insect control and manuring were the same as for the orange plot.

The crop was intercropped with sweet potatoes, corn, black eye peas, bananas and plantains. The two latter crops are planted in the orchard rows and have been reduced to allow for the rapid expansion of the grapefruit trees.

Plot 3, Avocado Pears.

The trees have developed rapidly and even precociously, and present a handsome appearance. The union of the cleft grafted varieties appears to be quite satisfactory and the West Indian root stock is producing a promising orchard tree. Trees are now 15′ high, with a spread of 12′, being two years of age. The plot has been drained and the papaws, bananas, and plantains which serve as temporary shade have been greatly reduced to allow for further expansion of the fruit trees.

A few trees were attacked by scale insects, and resin wash (1 in 4) proved an effective control.

One tree of G.H., a local variety, flowered in March, but set no fruit. One G.H. tree died from canker of the stem and one of St. Anne's variety died from the effects of last year's flood ; from these losses and other experience it is apparent that a low water table and good drainage is essential for avocado growing. All the tree received bay mulch, but no artificial fertiliser. This should be rectified in the new growing season, as it is important that the early

growth stages of the avocado should be accompanied by ample available food, preferably organic manure, otherwise a check results followed by defoliation and sunburning, and loss of the tree.

Plot 4, Mangoes.

The plot now contains thirty Julie and eighteen Peach mango trees. They have all made very satisfactory growth and are well shaped. Five trees flowered in February and three of these carried ripened fruits of excellent flavour.

All the mango trees received bay leaf mulch and no artificial fertiliser. One plantain tree has been planted between each tree in the orchard rows, and the remainder of the plot has been intercropped with sweet potatoes and black-eye peas.

Costs and Returns.

The following schedule shows the working expenses and income of the Demonstration Orchards from the commencement in 1931 to the end of 1932, a more satisfactory balance being maintained through lapse of the heavy clearing operations and with more experienced management.

An amount of £48 is provided annually in the Agricultural Estimates for the establishment and maintenance of the orchard trees in the Demonstration Orchards until the crop commences. Other crops mainly vegetables and ground provisions are financed by a Working Account by which the crops made are delivered to Government Institutions or sold and credited to this Account, the local market value being taken to avoid competition. The Account started with a debit of £19 14 1 for clearing, and crop planting for which £29 19 1 was used, and concluded in December with a sales value of £56 1 9, thus showing a credit balance of £6 8 7 with some crops unreaped.

Plot 1, ORANGE, 1 acre (=72 trees).

Expenditure.	£	s.	d.	£	s.	d.
1932.						
Orchard trees—						
Clearing ...	4	15	11			
Tilling		9	4			
Draining ...	2	5	5			
Manuring ...	2	8	0			
Upkeep	2	13	0	12	11	8*
Intercrops—						
Yams:						
Planting ...	3	4	5			
Upkeep ...	1	19	1			
Reaping ...		4	0			
Potato-yams:						
Planting ...	1	3	3			
Upkeep ...	1	4	11			
Sweet Potatoes:						
Planting ...	1	17	6			
Upkeep ...		13	6	10	6	8
				22	18	4
1931. (Brought forward)						
Orchard trees ...	5	4	2*			
Intercrops ...	6	19	8	12	3	10
				£35	2	2

* Total cost per tree, 1931—32=4/11.

Revenue.	£	s.	d.	£	s.	d.
1932.						
Intercrops—						
Bananas 27 bunches		14	8			
Plantains 14 ,,	1	8	10			
Yam 1,876 lb. ...	5	17	3			
Tanias ...	1	12	7			
Sweet Potatoes ...	1	12	6			
Misc. Vegetables ...	2	15	2	14	1	0
Potato-Yams not yet reaped.						
Sweet Potatoes no return due to wet weather.						
				14	1	0
1931. (Brought forward)						
Intercrops ...				4	11	5
				£18	12	5

Plot 2, GRAPEFRUIT, 1 acre (=72 trees).

Expenditure.	£	s.	d.	£	s.	d.
1932.						
Orchard trees—						
Clearing ...	3	8	3			
Tilling	1	14	3			
Draining ...	2	1	0			
Manuring ...	2	10	0			
Upkeep ...	3	1	10	12	15	4*
Intercrops—						
Potato-yams :						
Reaping ...		6	1			
Sweet potatoes :						
Planting ...	2	14	5			
Reaping ...		8	8			
Lisbon yams :						
Reaping ...		3	0			
Corn & Black-eye peas :						
Planting ...	1	4	6			
Reaping ...		9	7			
Plantains and bananas :						
Planting ...		10	0	5	16	3
				£18	11	7
1931. (Brought forward)						
Orchard trees ...	4	19	5*			
Intercrops ...	18	18	2	23	17	7
				£42	9	2

* Total cost per tree, 1931—32=4/11.

Revenue.	£	s.	d.	£	s.	d.
1932.						
Intercrops—						
Potato-Yams						
2,392 lb. ...	4	18	6			
Sweet Potatoes						
1,851 lb. ...	4	2	2			
Peas 158 lb. ...	1	6	6			
Corn ...		5	6			
Bananas 9 bunches ...		3	2			
Plantains 30 ,, ...	3	6	2			
Lisbon yams 100 lb....		7	8	£4	9	8
				£14	9	8
1931. (Brought forward)						
Intercrops ...				10	5	8
				£24	15	4

Plot 3, AVOCADO PEARS, 1 acre (=48 trees).

Expenditure.	£	s.	d.	£	s.	d.
1932.						
Orchard trees—						
Tilling	8	1	4			
Draining ...		16	8			
Upkeep ...	3	18	2	12	16	2*
Intercrops—						
Tanias :						
Planting ...	1	4	9			
Plantains :						
Planting ...	1	8	8			
Black-eye peas :						
Planting ...		12	3	3	5	8
				16	1	10
1931. (Brought forward)						
Orchard trees ...	11	1	8*			
Intercrops ...	3	12	1	14	13	9
				£30	15	7

* Total cost per tree, 1931—32=9/11d.

Revenue.	£	s.	d.	£	s.	d.
1932.						
Intercrops—						
Tanias 92 lb. ...		3	10			
Plantains 29 bunches	2	5	6			
Bananas 89 ,,	2	3	7			
Sweet potatoes ...		2	1			
Miscellaneous ...	4	11	9	9	6	9
Tanias & peas not completely reaped.						
				9	6	9
1931. (Brought forward)						
Intercrops ...				3	10	0
				£12	16	9

Plot 4, MANGOES, 1 acre (=48 trees).

Expenditure.	£	s.	d.	£	s.	d.	Revenue.	£	s.	d.	£	s.	d.
1932.							1932.						
Orchard trees—							*Intercrops*—						
Tilling	3	1	7				Sweet potatoes 2,802 lb. ...	5	16	8			
Draining ...	1	15	9				Tomatoes 78 lb. ...		12	4			
Upkeep ...	3	0	6	7	17	10*	Peas, 240 lb. ...	2	1	0			
Intercrops—							Miscellaneous ...		10	0	9	0	0
Sweet potatoes ...	3	4	6				Plantains not yet reaped						
Tomatoes ...		6	7								£9	0	0
Black-eye peas ...	2	0	0										
Plantains ...		2	7	5	13	8	1931. (Brought forward)						
				£13	11	6	Intercrops ...				1	16	4
1931. (Brought forward)													
Orchard trees ...	3	0	3*										
Intercrops ...	7	18	8	10	18	11							
				£24	10	5					£10	16	4

* Total cost per tree, 1931—32=4/6.

Extension Plot.

The extension of the demonstration orchard section was cultivated last year and is now used as a plot in which newly introduced orchard trees will be planted. Up to the present 10 Foster's Pink grapefruit trees, and 4 Trapp, 2 Butler and 2 Simmonds avocado pear trees raised from budwood presented by Dr. Fairchild in 1932, have been established in this plot. The following note on the two popular varieties indicates their points of value as fruit crops—

Grapefruit, Foster's Pink—A handsome pink fleshed variety, a bud-variant of "Walter's" yellow grapefruit; very attractive and classed as a luxury fruit, though no more difficult to grow than the yellow fleshed varieties; fruiting in November—December.

Avocado, Trapp—A West Indian variety of Florida origin, where it was extensively cultivated, being the best late variety, fruiting from October to January when fresh fruit is scarce. Reported a very prolific and regular bearer, carrying at maturity up to 500 crates per acre or 5 crates per tree, the average pack being forty fruit per crate. A good market variety, being freighted without cold storage for about eight days without loss. Fruit oblate and firm; skin leathery; seed nearly tight-fitting. Average net return per crate $5·25 (Popenoe).

This plot was intercropped with sweet potatoes and black-eye peas.

AGRICULTURAL CADETS.

As mentioned in the Annual Report for 1931, one boy from the 1931 Cadets has been kept for a second year course, and has acted as a leader to the three new boys from the Primary Schools who were selected as first year cadets and came to Union in April.

The appointment of one of these boys was not confirmed after the period of three months probation as he could not adapt himself to the work of the Station.

On the whole the three boys in training this year have worked well; their

conduct has been very good, and the results of the examination in the theoretical work were satisfactory, the marks awarded being as follows :—

2nd year cadet	...	R. Daniel	... 62 per cent.
1st ,, ,,	...	V. Alexander	... 50 ,, ,,
1st ,, ,,	...	C. Biscette	... 37 ,, ,,

The second year cadet, having completed his course, has now been engaged as a nurseryman at the Station. The remaining two boys will enter the second year period, and with three new cadets now being selected will be trained on the curriculum published last year. This work is undertaken by the Assistant Superintendent and the Agricultural Instructor.

The catering, washing and domestic duties are performed by a paid housekeeper and furnished accommodation is provided. The cost of the two years training is approximately £47 for each cadet, and is now provided for in the annual Estimates.

FOREST CONSERVATION.

No further work was done on forest inspection through the absence of the Agricultural Superintendent on leave during the year. A small collection of timber hand specimens has been made and representative samples were supplied to a visitor, who wished to discuss local timbers before the Royal Society of Engineers with a view to ascertaining the market value of hard and soft woods under the new tariff.

A collection of some five hundred plants of mahogany (*Swietenia mahogoni* L.), Teak (*Tectona grandis* L.) Red Cedar (*Cedrela odorata* L.) and Red Sandalwood (*Adenanthera pavonina*) was planted in suitable clearings and has grown well. Good results have also been obtained in estate plantings. Aerial photographs of forest areas were taken during a visit of the Atlantic Squadron; this co-operation is gratefully acknowledged. The photographs became the property of the Department.

A large increase in forest products exported is noted for the year, the total value being £5,415 as against £3,012 in 1931. Charcoal continues to be the principal item, 79,960 bags valued at £4,042 being exported, as compared with 39,803 bags valued at £2,031 in 1931. The trade is encouraged by a French bonus of 10 centimes per kilo per 10% weight on charcoal delivered in Fort-de-France, Martinique. This development should be carefully watched, and any extension of clearings for charcoal should be confined to bushland, or be later converted into productive holdings if in arable soil.

CONTROL OF INSECT PESTS.

There was no serious development of insect pests during the year and the staple and minor crops were comparatively free of destructive pests other than those normally present, such as moth borer of cane and scale insects on citrus. On the former pest some interesting data have been collected and are described below.

Citrus.

With regard to the scale insect pests, the position has been much improved with the greater care now being given to the orchard trees on estates. The advantage of sufficient funds and staff ensures that only good rootstocks and well grown trees are now sent out, and these are much superior

to the earlier productions and also cost less for maintenance than do trees produced on estates. Consequently the need for specifics and grease-banding is less, while the benefit derived from manuring is greater and produces a good growth increment which is less subject to pests. Scale washes are still necessary periodically, and the best results have been obtained from whale-oil soap sprays and resin wash. The number of private and official spraying appliances has increased and demonstrations of their uses and the making of tree washes is a frequent occurrence during visits of the Agricultural Officers.

Numbers of grapefruit and orange fruits produced on young trees have been affected with a brownish scurf-like deposit on the rind, apparently due to scale insects and citrus mite attack; it is most evident on exposed fruits. It is usually found on trees suffering from "greasy spot" pigmentation due to some physiological disturbance, and freer drainage and manuring is recommended, in addition to spraying periodically.

Moth Borer Investigation.

In order to arrive at an estimate of sugar loss caused by the moth borer (*Diatraea saccharalis*), initial counts of field infestation at two factories have been carried out by the Assistant Superintendent. The method employed is that recommended by the Barbados Department of Agriculture, and acknowledgment is here due for the active assistance and interpretation of results which the Department has received from this co-operation. The counts will need to be continued for a succession of crops in the same areas before a definite evaluation of crop loss can be given, and this is being arranged in conjunction with the estate managements who are interested in this work. A preliminary note is therefore included here as descriptive of conditions so far revealed.

Loss from Moth Borer Infestation and Rat Damage in four fields (April—May) Crop 1932—1933.

Crop.	Field loss, % rat damage.	Field loss, % moth borer.	Factory loss, % sucrose.	Total loss, % crop.
Field 1. 1st ratoon BH 10 (12)	2·72	2·92	1·14	6·78
,, 2. Plant canes BH 10 (12)	—	19·34	2·66	22·00
,, 3. do.	—	16·27	2·64	18·91
,, 4. do.	2·00	10·44	3·27	15·71
Plant canes ..,	Average borer loss		...	18·20%
	... Average joint infestation		...	14·14%*
Ratoon & Plant canes	... Average borer loss ...		...	14·67%
	... Average joint infestation		...	12·01%
Ratoon canes.	... Average borer loss		...	4·06%
	... Average joint infestation		...	5·62%

* As compared with Barbados average: 1931 = 28·1%, 1932 = 16·9%.

On the above figures joint infestation and borer loss is highest in plant canes and lowest in ratoons. The Barbados figures show higher infestation than locally, but a notable reduction of 11·2 per cent. is also shown there, and is believed due to the liberation of parasites (*Trichogramma minutum*) effected by the moth borer control campaign.

CONTROL OF FUNGUS DISEASES.

CITRUS DISEASES.

(*a*) *Withertip and Blossom Blight of Limes.*

Weather conditions during the first five months of the year being mainly wet were conducive to the extension of the fungus *Gloeosporium limetticolum*, and some Withertip was apparent during April—May. The subsequent wet

and cold weather prolonged the period of ripening, and an onset of Blossom Blight was recorded in November. The crop for the year is expected to be only normal or possibly lower and the external factors determining this are discussed under "PROGRESS IN THE CHIEF INDUSTRIES".

(*b*) *Scab Disease of Sour Orange.*

This disease was comparatively unknown locally prior to 1931, when the accumulation of a large number of stocks in the nurseries rendered its spread an easy matter, and in consequence it has become one of the most troublesome diseases in nursery work. This condition, however, applies only to the nurseries on the heavier soils, such as at Union; the stocks on light, open soils as at Rabot Nursery, Soufrière, and Dennery, remain free of scab. Spraying and handpicking have been carried out systematically and are effective when drier weather prevails. Shading the seed bed has been reported as giving striking results, and this is being tried.

CACAO AND COCONUT DISEASES.

No special observations were made during the season, and the recurrence of black and brown pod-rots was apparently less severe than usual, as a good crop was present up to the end of the year.

Coconut budrots were found to be increasing in one littoral area subject to tidal floods, where free outward drainage is restricted during heavy weather. In most cases a budrot palm was detected by the presence of a single, broken and dead leaf of the bud, and on which the secondary leaf fungus *Diplodia* was found. The serious cases were felled and destroyed, and others with the secondary affection only remain under observation. Twenty cases of budrots in all have been treated at different sites during 1932.

PLANT QUARANTINE.

The importation of plant material continued to be carefully watched during the year, and four introductions were destroyed as being likely to introduce diseases or pests; these consisted of corn and coffee and citrus plants in soil. Fifty-five major inspections were made, and treatment accorded as necessary, the plants etc., being returned to the importing agent.

The following plant material is not permitted importation into this Colony as it may be a means of introducing diseases or pests:—

1.

Plants and seeds of all kinds from Ceylon—vide Revised Rules and Orders, 1916, Ch. 7, Sec. 2 (*a*).

2. COCONUTS.

Coconuts, coconut plants or any parts thereof from all places, except under licence—vide Proclamation No. 2 of 1924.

3. BANANAS.

Banana plants or any parts thereof that may have come directly or indirectly from Trinidad, Tobago, Grenada, Central and South America, Canary Islands, West Africa, and Jamaica—vide Proclamation gazetted 8th September, 1917, and Proclamations Nos. 6 and 13 of 1925.

4. CACAO.

Cacao plants from South America, East and South of the Isthmus of Panama—vide Revised Rules and Orders of St. Lucia, 1916, Ch. 7 Sec. 2 (*b*).

5. Citrus (Orange, Grapefruit, Limes, &c.)

The importation of all plants of the citrus family is prohibited, except under licence—vide Proclamation No. 3 of 1927.

6. Cotton.

Cotton seed and all parts of the cotton plant are prohibited except under licence, and subject to treatment on arrival—vide Proclamation No. 3 of 1924.

7. Coffee, etc.

The importation of all coffee, mango, guava, sapodilla and star-apple plants from the Bahama Islands, Ceylon, Cuba, India, Jamaica and the Philippine Islands is prohibited—vide Proclamation gazetted 10th February, 1917.

8. Sugar-Cane.

All plants of the grass family including sugar-cane, sweet corn, and sorghum, are prohibited except under licence—vide Proclamation No. 6 of 1921.

9. Soil, Containers, etc.

Any earth or any container in which prohibited plants may be or may have been packed is prohibited—vide Revised Rules and Orders of St. Lucia, 1916, Ch. 7, Sec. 2 (*f*).

10. Fruit and Vegetables.

By notice No. 7 of 1930 under the authority of the Customs Amendment Ordinance, the importation of soil, fruit and vegetables—except plantains, nuts, onions, Irish potatoes, and canned, dried or processed fruit and vegetables—is absolutely prohibited from all countries other than the British Isles, Canada, and the British West Indies (which does not include the Bermudas, the Bahamas, or British Guiana). All importations from countries permitted must be accompanied by a certificate of origin stating that the material has not been grown in an area affected by the Mediterranean Fruit Fly, and has been inspected, and is free from that pest.

Exportation of Plant Material.

Exporters of fresh fruit, plants and seeds may obtain information on overseas quarantine and certificates when necessary from the Agricultural Department.

DISEASES AND PESTS WITHIN THE COLONY.

The existence of the following diseases and pests should be notified to the Agricultural Department in order to comply with the requirements of the Plants Protection Ordinance :—

Coconuts—Budrot of coconuts.

Sugar-Cane—Gumming disease of sugar-cane.

Bananas—Panama disease, marasmius disease, banana weevil and borer.

Cotton—Pink bollworm of cotton.

The presence of the parasites "love vine" and "bird vine" should also be reported.

ANIMAL QUARANTINE.

FARM PRODUCTS.

Under Ordinance No. 17 the Governor in Council may prohibit the importation of animals or farm products which may be a means of introducing disease; the importation of animals and farm products from the United Kingdom, Isle of Man, and Channel Islands is prohibited; the importation of parrots and all birds of the species *Psittaciformes* (*Psittacidae*) is absolutely prohibited.

Importation of Bees.

Under Ordinance No. 18 the importation of any queen bee or used bee-keeping apparatus is prohibited except under certificate approved by the Agricultural Superintendent to the effect that Foul Brood has not existed in the apiary or in connection therewith.

FARM STOCK AND POULTRY.

Much interest continues to be shown in farm stock and poultry and several importations were made during the year, principally of Holstein cattle for breeding, sheep and pigs, and day-old chicks. The value of imported meat animals was £205 (duty £12)=£217 in 1931. The value of imported prepared and chilled meats was £1,605 (duty £454)=£2,059 in 1931; when viewing this supply as a possible and highly desirable local industry, a considerable proportion of such importations could have been raised and cold stored locally.

Government Farm Stock Introduction under the Colonial Development Fund Grant.

The importation of the following animals has been made under the grant—

One pedigree Holstein-Freisian bull, "Gerald II", born November 1929; cost £30; received March 1932, through the Government Stock Farm, Trinidad.

One ¾-bred Holstein (Zebu) bull, "Arneaud", born March 1931; cost £15; received December 1932, from Trinidad.

Three large Black pigs, one boar, two sows, born in 1932; cost £3 2/- each; received October 1932, from Trinidad.

Two Persian Black-headed sheep, ram and ewe, born December 1931 and June 1932 at Trinidad; cost £7 7/- and £5 4/- respectively.

The pure bred bull is in good condition and has grown well. A total of 24 services has been made from July for planters and smallholders, at the rate of 3/- and 1/6 respectively, with special terms in approved cases, and the demand continues. During 1933 it is proposed to loan the bull to selected farmers for services on the estates.

The grade bull is not yet full grown and will be available for service later on while the pure bred bull is stationed at Union. Prior to purchase both these bulls were inspected and passed the tuberculin test.

The following rations are used for the animals—

	Gerald 3 years.	Arneaud 22 months.
Two feeds of concentrates (½ linseed meal and ½ maize meal	5 lb.	4 lb.
Molasses	1 pt.	1 pt.
Fine salt (weekly)	1 oz.	1 oz.
Cut grass, daily	75 lb.	75 lb.
Also grazing for 4—7 hours daily.		

Rations for the pigs consist of cooked food—potatoes, tanias, bananas, etc.—twice daily with 1 lb. linseed meal and ½-pint molasses, and salt, weekly.

The sheep feed on cut fodder of Para and Guinea grasses, and are kept in stalls provided with wooden gratings to avoid wetness and foot-rot. The cross between this breed and the local sheep is said to be promising, and should combine meat value of the former with the hardiness of the local breed.

The pasture has been extended and more Guinea grass planted to meet the requirements of the animals.

The greater interest shown locally in breeding is very encouraging, but it should be more generally realised that good cattle can only be maintained on good rations and satisfactory pastures, which should contain a high proportion of palatable grass; also that inferior scrub bulls should be eliminated, and no bulls should run with the herd. The first need can be met by balanced feeding, and by weeding and replanting pastures with useful grasses from the Department; while the second can be met by the use of bloodless castrators of which several are present in the Island, and by services only under controlled conditions.

Poultry.

Interest in poultry has increased and extends to fowls, turkeys and ducks, of which several new breeds have been imported recently. There is a small but growing trade in imported chilled game which could be adequately met by local raising and cold storing of birds, with the advantage of cheap corn and other local grains, the cultivation of which has been neglected during recent years. This is partly due to a reduction in peasants' cane gardens where corn served as an intercrop in replanting, and to poor returns through non-manuring and uncontrolled corn-ear worm.

The introduction of day-old chicks from Florida by the Pan-American Airways has been developed lately and has had varying success locally. Some very good birds have been seen and where personal attention is given to the chicks, these seem to acclimatise readily. High mortality is to be expected if a carefully proportioned ration is not provided, and the chicks should be kept in warm hover pens raised 4 feet off the ground to avoid parasitic infection. After 36 hours the ration should consist of soft foods such as boiled egg and rice, soaked biscuits or stale bread, with chopped greenstuff, and after three days the replacement of soft food by crushed grain is recommended.

Up to the present about 750 chicks at 1/- each have been introduced by air mail.

EXAMINATION OF AGRICULTURAL PRODUCTS.

Analyses of Lime Oils.

Owing to the occurrence of complaints on certain parcels of lime oils, it was found necessary to have samples collected and sent for analysis. The Imperial Institute, South Kensington, undertook the examination of samples handed in by one planter, and others were provided and examined at the Imperial College of Tropical Agriculture, and further samples were reported on by chemists in New York.

The final conclusions reached on assembling the data thus provided, suggest that apart from accidental or intentional damage in transit, certain precautions should be more generally adopted by the lime oil producers locally, and these have been recommended to growers, viz.,

1. The use of sound, ripe limes only.

2. The removal by straining, of coarse pulp and seeds ; straining should take place as soon as possible, to prevent fermentation.

3. The use of clean containers, and of a clean still which should be washed after each distillation.

4. Slow and even distillation ; the rejection of the last 8-10% of the charge, which, if sold, should be bottled and labelled separately.

5. Handpressed and distilled oils should be bottled separately, and kept in the dark in tightly corked containers.

Producers who have adhered to these principles have received excellent reports on their oils, and general agreement in this should remove the danger of adverse reports affecting the industry, This is the more important now that the citrus acid and lime juice markets are dormant, and the fact that adulteration is extremely easy, as it is very difficult to detect it without expert help.

In compliance with the wish of certain producers, the Agricultural Department is prepared to sample and seal lime oil parcels, in order to assure immunity from tampering in transit.

PROGRESS IN THE CHIEF INDUSTRIES.

SUGAR.

The interest in sugar production was well maintained under the more stable market conditions prevailing in 1932. Cultivation was nevertheless confined mainly to the large estates and in these the crop returns for the year were very satisfactory. Roseau factory carried the bulk of the crop, or 45 per cent. of the total production, a very creditable record for this fertile valley. The replacement of coconuts by sugar-cane continued in the Mabouya valley (La Cayé) and a small amount of sugar was made from the existing crop. The total production of 5,452 tons was a marked advance on the crops for the last four years, and apart from weather conditions is mainly due to improved and closer plantings, drainage, and general management, rather than extension in area, which was only slightly increased, and is now 4,150 acres.

The total production (5,452 tons) of which 387 tons consisted of 2nd sugars, is compared with 4,572 tons made in 1931 ; the exported crop being 4,990 tons valued at £46,466, as against 3,973 tons valued at £35,554 in 1931. This is an encouraging recovery in production and value (i.e. plus 1,017 tons ; plus £10,912) the value per ton having been augmented by approximately 6/- on the 1931 average.

The production of molasses and syrup was increased from 24,837 gallons, valued at £1,194 in 1931, to 32,988 gallons valued at £1,453 in 1932, this trade also showing a partial recovery to more normal production.

The manufacture of rum was confined to the quantity required for local consumption, no rum being exported, and was slightly less than for the preceding year—30,485 proof gallons as against 31,003 gallons in 1931, produced mainly at Vieux-Fort Factory.

The total exportable value of sugar products is thus £47,919, as compared with £36,748 in 1931, and judging by market comments it would appear that the worst of the depression has been weathered, and future progress should be more encouraging. The fixing of the Cuban crop in March by Presidential Decree at 2,700,000 tons and subsequent limitations in other sugar countries, enabled sugar producers to arrange for the new crop, 1933, and it is expected

that a further increase in tonnage for the present year will assist in the return to normal production and values in the key industry.

The following schedule illustrates the departures from normal and the low values over the past 5 years.

		1928.	1929.	1930.	1931.	1932.
Sugar—						
Production	tons ...	4,042	4,997	5,153	4,572	5,452
Export	tons ...	4,100	4,536	4,567	3,973	4,990
Export values	£ ...	63,050	51,237	45,289	35,554	46,466
Molasses and Syrup—						
Export	gall. ...	85,784	127,273	157,254	24,837	32,988
Export values	£ ...	3,643	3,047	2,872	1,194	1,453
Rum—						
Export	gall. ...	1,323	2,043	1,583	nil	nil
Export values	£ ...	218	339	278	nil	nil

The market values as indicated above were slightly more favourable on the whole, although severe depression was patent in January—March, when quotations fell from £10 15/- c.i.f. (Raw Preferential 96°) to £8 2 6 per ton. Prices thereafter improved gradually and the markets reported the crisis as safely passed in June and July, with prices firmer and rising, from £10 7 6. to £11 7 6 in August; this was the peak quotation, and subsequent reductions left the prices at £10 to £9 15s. in December.

In view of these disturbing factors, it is a pleasure to record that factory and field maintenance is more carefully supervised than before, and it has even been found possible to initiate the randomised fertiliser trials at Roseau previously mentioned (Annual Report 1931). The selected area of 1 acre has received general pen manure throughout at planting time, followed by the prescribed applications of:

"A" control—no manures;

"B"—200 lb. sulphate of ammonia per acre (=40 lb. Nitrogen);

"C"—300 lb. sulphate of ammonia per acre (=60 lb. Nitrogen);

"D"—400 lb. sulphate of ammonia per acre; and

"E"—600 lb. sulphate of ammonia per acre.

With reference to the economic application of fertiliser, these trials are expected to yield valuable information as it is apparent from the soil analysis recently reported on, that certain areas require only a small dose for economic returns.

The co-operation of the field staffs in moth-borer investigations is also very practical and satisfactory; and in general there is an increasing appreciation of the application of science to plantation and sugar factory development.

The new Barbados canes imported and released have been actively taken up by the progressive managements, and the gradual disappearance of the less profitable varieties is established practice on most estates. In one area now being replanted this has not been so carefully carried out and mixtures of new and old canes are still common. This uneconomic method is due to absence of nursery propagation of varieties, and a nursery should be established on the estate to provide ample "seed" for new beds.

The introduction of a caterpillar tractor for breaking up cane land has been watched with interest and has enabled late planting to proceed without the delay customary with hand labour. The layout of bed initials and drains

is not very satisfactory however, and a season's experience will no doubt stress the urgency of cross drains and open beds as compared with the closed parallel drains and beds in flat land.

CACAO.

The prolonged distress of the cacao market has forced out of cultivation several plantations which therefore are being converted to limes and other fresh fruits. Consequently a reduction in cacao exports is to be expected for the next few years, and only the more firmly established grades will be safely grown and placed on the market. The exported amount was low, 8,188 cwts. valued at £9,091, as compared with the previous year 10,419 cwt. at £14,125. A better illustration of planting conditions is afforded however by turning to the prices ruling, when a similar low export was recorded in 1920—exported amount 8,966 cwt. valued at £43, 944; markets quoting at 128/- per cwt. and later at 40/- per cwt. Cacao planting has thus become a survival of the fittest, and only well known marks have received the best available price, 36/- to 37/- per cwt. c.i.f. The attention given to curing is thus worth while, enabling a superior product to be marketed in competition with the co-operative West African supplies and in the face of the large stocks still held in the markets. The season was a satisfactory one judging by crop conditions, and less black pod was reported, through spells of dry weather intervening during crop formation. The area in cacao is estimated at 5,500 acres, a reduction of about 500 acres during the last two years.

The production of green and peasants cacao has become a problem not capable of solution by advisory work. The present form of marketing consists of bulking green or half-dried cacao, at 2 cents to 3 cents per lb., which is then exported to Trinidad and re-exported thence under the brand "St. Lucia" cacao. While fairly conducted as an ordinary brokering business, this method is certain to injure the good name of St. Lucia cacao through non-discrimination in the markets, and it is proposed that all cacao exported should be grouped into the two natural grades "Estate" and "Mixed", thereby safeguarding the best grades with their accepted marks. Mixed cacao, green and partially dried beans would then be sold openly as low grade produce, and any subsequent improvement to a better standard would be followed by a superior grade designation.

Attempts to improve the manufacture of peasants cacao by bulking and by providing boxes have failed through the small and scattered amounts available and the general apathy of the smallholder, who is not prepared to improve for a theoretical benefit, when green cacao can be sold for cash. No progress can be made in the miscellaneous collection of cacao, without an advance for crops received, as in Tobago, yet it would be unwise to finance small peasants cacao under prevailing market conditions. The majority of peasants plots of cacao are too neglected and insignificant to permit of profitable returns, and these are being discouraged for the more directly productive lime and other fruit crops, accompanied by provisions. In any such crop, the Government Marketing Depot will be of direct assistance by marketing the graded produce.

The exports of cacao for the five year period are compared below :—

		1928.	1929.	1930.	1931.	1932.
Export ...	cwt.	11,006	8,906	10,449	10,419	8,188
Value ...	£	27,341	18,864	19,261	14,125	9,091.

LIMES.

The lime crop for 1932 was considerably below that for the previous year, which gave an exceptionally good crop, and is estimated at 44,762 barrels of

fruit* as compared with 50,339 barrels in 1931, or a decrease of 11 per cent. This is however quite a reasonable variation, and is partially due to the activity of *Gloeosporium* fungus in the blossom-blight stage of the disease, and the subsequent dropping of young fruit, the incidence of the disease being greater than in the previous year owing to the alternately wet and dry periods and cold spells which occurred throughout the year, with a generally increased humidity. The heavy crop for the previous year may also account for the somewhat reduced production, and slow crop, which would have been more serious had manuring and mulches been neglected. These measures are still carried out, however, and irrigation is practised to some extent. In estates where limes have been close planted and thinned out later by removal of alternate rows, the trees have covered in fairly well, although their framework is poor and subject to breakdown on the extended branches. New plantings are estimated to be progressing at the rate of 50 acres per annum, mainly in lime seedlings, but with an increasing proportion of budded plants which are now more readily available. The area in limes is estimated at 2,650 acres.

The exports of concentrated juice and raw juice for the year were largely derived from stored juices, as very little of either product was made during the present crop, owing to low prices. The average rate for raw juice was from 1/9 to 2/6 per gallon, while concentrated juice never varied from £5 per pipe c.i.f., both rates being approximately one-fifth of the prices obtainable ten years ago.

The production of distilled oil which is now the leading product in the lime trade, was stimulated through the satisfactory prices ruling, quotations around 32/- to 33/6 per lb. being the average rate with extremes of 30/- and 37/-. The general crop returns indicated a shortage in September and October and an improvement in the market was evident towards the end of the year.

The production of handpressed oil was smaller through the reduced crop and more activity in the distillation process, but this product was also well quoted at 55/- to 50/- average price, with extremes of 60/- and 45/- per lb. c.i.f.

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* *Note on Calculation of Total Lime Crop in Barrels.*

1. The calculation of the annual crop up to 1930 has been made on the total production of concentrated and raw juices as—

Gallons concentrated × 10=raw juice.
Total raw juice ÷ 7=barrels limes.
Total limes (barrels) including green limes=total crop.

2. Following the rejection of much juice not exported in 1931 the crop was calculated on a basis of 4 oz. distilled oil per barrel, plus raw juice, plus green limes exported.

3. The Assistant Commissioner of Agriculture has now recommended the adoption of the following factors based on Dominica yields, i.e.

(a) $5\frac{1}{3}$ oz. *total oils* if distilled=1 barrel limes (1 lb. oil=3 barrels of limes)=distilled oil 10,345 lb. × 3=*31,035 barrels* (assuming that 2 oz. distilled, 2 oz. handpressed, $1\frac{1}{3}$ oz. lost in manufacture).

(b) plus exported handpressed oil @ 2 oz. per barrel, or lb. × 8=barrels limes by handpressed oil=1,989 × 8=*15,912 barrels*. Total barrels (a + b)=46,947.

(c) Subtract 1,989 × 3 barrels included in (a), i.e. 46,947 − 5,967=40,980.

(d) plus green limes exported (40,980 + 3,782)=44,762 barrels, total crop.

4. Dominica yields of oil are considered lower than for St. Lucia, for which the following factors might be substituted throughout—

(a) *Total oils* $6\frac{2}{5}$ oz. per barrel, assuming that $2\frac{2}{7}$ oz. handpressed, $2\frac{6}{7}$ oz. distilled, $1\frac{9}{35}$ oz. lost in manufacture.

On this basis the crop works out at:—

1931	...	43,654 barrels, total crop.
1932	...	38,595 „ „ „

The value of total oils exported was approximately four-fifths of the total value of the exported lime products. To prevent the recurrence of complaints on lime oils as exported, it is proposed to sample and certify the prepared products, as mentioned more fully under "EXAMINATION OF AGRICULTURAL PRODUCTS".

The export of green limes was slightly reduced through inaction mainly in Canada, where the green lime trade needs extensive advertising to popularise the fruit as a superior substitute for lemons. In this connection an important movement has been started by the Canadian Horticultural Council which has put forward a scheme to increase the consumption of Empire grown fruit and vegetables by an extensive advertising campaign. Shippers and jobbers alike are asked to contribute at the total rate of $2.00 per carload charged equally against them, the proceeds to finance press, radio, and leaflet propaganda by advertising agents. A number of the principal growers have agreed to take part in the contribution, while others are uninterested.

The importation of fruits, fruit juices and essential oils into the United Kingdom is subject to a preference of 10% ad valorem, and it is probable that this trade will extend in the near future. There is a very large annual consumption of prepared orange and grapefruit juices, and attractively bottled "Pure St. Lucia Lime Juice" was also observed in chain stores during the summer.

Amount and Values of Lime Products, 1928—1932.

		1928.	1929.	1930.	1931.	1932.
Concentrated Lime Juice	gall. ...	18,028	21,259	16,050	10,312	7,280
Value ...	£ ...	4,998	5,879	2,312	650	78
Raw Lime Juice	gall. ...	12,598	40,675	5,140	6,961	4,069
Value ...	£ ...	631	3,212	183	297	152
Distilled Lime Oil	lb. ...	10,436	6,166	8,587	10,310	10,345
Value ...	£ ...	12,261	9,049	10,751	14,524	11,662
Handpressed Lime Oil	lb. ...	4,665	2,964	2,955	3,059	1,989
Value ...	£ ...	9,820	9,633	7,155	5,236	3,337
Green Limes ...	brls. ...	1,553	1,165	2,308	4,114	3,782
Value ...	£ ...	2,014	1,758	3,218	5,418	5,552
Lime Seeds ...	lb. ...	7,428	nil	nil	nil	nil
Value ...	£ ...	45	nil	nil	nil	nil
Total crop, estimated in barrels of fruit	...	56,186	34,483	42,844	50,339	44,762
Value ...	£ ...	29,796	29,531	23,619	26,125	20,781

COCONUTS.

Satisfactory progress has been made in the coconut industry, and the total value of exports was increased to £7,819 as against £7,047 in 1931. This was directly attributable to the large exports of dry nuts for consumption in Bermuda, Canada and the United Kingdom, a total increase of 70 per cent. in this trade being shown for the year. The English market is now active in importing nuts of "cull" size, approximately $3\frac{1}{2}$" diameter, 150 per bag, as compared with the Canadian market, 4" nuts at 110 per bag, and these sizes are distinctly profitable, realising 16/- per bag gross, or 8/- to 9/- net. The smaller sizes such as the golden-yellow coconut should therefore be selected and put aside as being unprofitable for copra and should be bulked for export in order to make up a profitable consignment. Smaller nuts may also be obtained more readily from the larger green varieties by allowing palms to carry the full crop and not practising the removal of unripe nuts;

the Dwarf coconut (green and red forms) is indicated as a profitable variety yielding upwards of 100 small nuts at 5 years of age at 100 trees per acre. It should be noted that there is now a preference of 10% on nuts imported into the United Kingdom.

Exports.		1928.	1929.	1930.	1931	1932.
Coconuts ...	No. ...	141,667	295,983	268,078	367,350	650,240
Value ...	£ ...	499	1,032	862	1,178	2,430
Copra ...	tons ...	315	359	400	498	432
Value ...	£ ...	8,690	9,878	7,428	5,869	5,389
Coconut oil ...	gall. ...	931	nil	nil	nil	nil
Value ...	£ ...	184	nil	nil	nil	nil
Coconut meal	lb. ...	8,994	3,874	nil	nil	nil
Value ...	£ ...	38	6	nil	nil	nil

Copra: Interest in ripe nuts and the slow movement of the markets was responsible for a decrease in copra exportation, 432 tons being shipped as against 498 for the previous year. Copra drying by flues is now in progress on most estates, with variable results, and a more efficient flue drier is to be recommended from actual estate trials carried out in Trinidad. This drier completes 1 ton of copra in 24 hours on estate fuel, and being of simple construction can be efficiently managed by estate labour. The cost per ton is given as £8 17/- c.i.f., as against the present £10—£12 for St. Lucia copra (i.e. production £7, bags £2, freight and insurance £3=£12), the recovery of copra being 360 lb. per 1,000 nuts, equal to 6,222 nuts per ton. In St. Lucia the average requirement is nearer 4,500 nuts per ton copra, thus recovery would approximate to 500 lb. copra per 1,000 nuts. This is the present condition with very little manuring, and it could certainly be improved upon by the systematic use of complete fertilisers and the reutilisation of plantation waste as broken fibre or wood ash, particularly on the flats where the best nuts are borne, and by the removal of the covering of grass mat to allow freer percolation and aeration.

The markets were not particularly active during the year, and a reasonable level of prices was maintained, from £16 falling to £14 5/- in midsummer, and a recovery to £15 5/- per ton c.i.f. at the end of the year. More discrimination is being practised by brokers now that ample stocks are in evidence, and as with other products, more careful preparation is necessary and the best marks are consequently more readily sold. Discoloration through moulds and high acidity due to improperly ripe nuts and imperfectly dried copra are objectionable features, the first particularly so, in view of the fact that copra is still bought mainly on the basis of its appearance.

PROGRESS IN THE MINOR INDUSTRIES.

FRESH FRUIT AND VEGETABLES.

The export trade in fresh fruit and vegetables shows a continued improvement and the total exports again exceeded those of the previous year, the avocado trade with Bermuda being particularly active. The total value of exports under this head was £10,175 as compared with £10,151 last year, the total packages shipped being less—21,983 as against 22,323 in 1931. This trade is therefore in a healthy condition and shows an average increase in value of £1,200 per annum over the last six years, and as during this period the trade was in its infancy and also weathered the most serious depression in the

markets for many years, it may safely be assumed that future progress will be much more intensive. More fruit will also be available as established orchards come into bearing, the present estimate being that of 90—100 acres, mainly in grapefruit; under the new citrus grant this will be increased to 1,000 acres in the next five years.

The following comparative schedule gives the exports and values for the five year period 1928—1932.

		1928.		1929.		1930.	
		Amount.	Value £	Amount.	Value £	Amount.	Value £
Green Limes	barrels ...	1,553	2,014	1,165	1,758	2,308	3,218
Grapefruit	crates ...	83	15	106	21	246	65
Oranges	,, ...	140	50	321	129	...	223
Mangoes	,, ...	...	1,014	...	1,383	...	915
Avocado Pears	,, ...	...	96	...	225	1,628	366
Pineapples	,, ...	...	7	...	83	49	18
Bananas	bchs. ...	5,543	338	6,818	509	4,568	219
Miscellaneous	...	...	2,843	...	1,560	...	1,613
Total	...	...	6,377	...	5,668	...	6,637

		1931.						
		Amount.						Value £
		To Canada.	To Bermuda.	To U.K.	To U.S.A.	To other places.	Total.	
Green Limes	barrels ...	130	567	69	3,307	41	4,114	5,418
Grapefruit	crates ...	...	79	14	...	9	102	36
Oranges	,, ...	4	271	...	3	89	367	169
Mangoes	,, ...	204	3,464	68	...	6,087	9,823	2,172
Avocado Pears	,, ...	34	2,789	...	...	101	2,924	567
Pineapples	,, ...	1	62	...	...	4	67	23
Bananas	bchs. ...	...	...	...	...	5,364	5,364	274
Miscellaneous	...	...	...	...	...	...	...	1,492
Total	...	...	...	...	...	...	...	10,151

		1932.						
		Amount.						Value £
		To Canada.	To Bermuda.	To U.K.	To U.S.A.	To other places.	Total.	
Green Limes	barrels ...	26	528	119	3,085	24	3,782	5,552
Grapefruit	crates ...	12	89	4	...	3	108	43
Oranges	,, ...	...	385	3	...	210	598	206
Mangoes	,, ...	195	3,491	413	...	3,655	7,754	1,655
Avocado Pears	,, ...	25	4,472	245	...	26	4,768	977
Pineapples	,, ...	85	76	44	...	1	206	96
Bananas	bchs. ...	...	...	...	...	...	3,149	183
Miscellaneous	...	...	...	...	...	...	...	1,463
Total	...	...	...	...	...	...	...	10,175

Marketing.

The condition of fruit on arrival at destination has been generally satisfactory; one shipment of 289 crates avocados to the United Kingdom was unsaleable through breakdown which was traced to cold storage failure on board ship. Further accommodation by provision of an extra chamber for fruit has now been made and no recurrence of this nature is expected. A general improvement in avocado arrivals is reported now that all fruit is precooled for shipment.

Under the existing shipping facilities the fruit trade with the United Kingdom is still backward and more frequent calls are necessary for extension in this market. Fruits such as grapefruit, avocados and mangoes seen in England during the season were generally inferior to local produce, and with improved export facilities and the benefit of the preference, it should be possible to take much fuller advantage of this market.

The valuable work conducted on transport conditions of the Short Fig or Governor or Chinese Banana (*Musa Cavendishii*) by the Empire Marketing Board officers attached to the Imperial College of Tropical Agriculture, Trinidad*, has again opened up possibilities of banana shipments to the north and elsewhere. Definite contracts were being debated at the end of the year and it is hoped that exports will soon be made on organised lines. This refers to Short Fig primarily, as no definite contract could be entered into with the "Gros Michel" on account of its susceptibility to Panama disease, and for bulk export a definite plan of cultivation and disease control only could succeed in producing a marketable crop of this variety.

The vegetable trade was not active during the year, and no tomatoes were grown for export. In this connection the production of melons, cucumbers and carrots for winter supply to the North American markets would seem to offer the most satisfactory returns.

Government Marketing Depot Inspection and Packing House Operations.

Inspection under the Fruit Ordinance during the year was conducted with an improved co-operation from exporters and a total of 12,239 packages was certified for export, as compared with 9,387 in 1931, viz., green limes, 2,626 crates; oranges, 388 crates; grapefruit, 105 crates; tangerines, 72 crates; avocados, 4,742 crates; pineapples, 205 crates; mangoes, 4,099 crates. Inspection fees amounted to £47 14/-. The Depot handled 400 crates packed for exporters, the remainder being packed by private agencies under supervision.

The Fruit Exportation Ordinance was amended in December and the following important provisions were enacted—

Establishment of a Government Marketing Depot as the principal packing premises, and licensing of private premises for (a) limes and (b) other fruits.

The co-operation of the Marketing Officer, Mr. A. C. Shill, M.Sc., A.R.C.S., D.I.C., A.I.C., has been of great advantage in obtaining information on markets, quotations, and packing house supplies; the cost of the latter, mainly crates, has been reduced by over 30 per cent. mainly through his activity in locating more satisfactory dealers. The proper organisation of shipments through the islands is an important factor in maintaining a fair market value. A full report on the activities of the Marketing Officer has now been published and is available on request. It contains extensive information on marketing conditions, material, crops, and returns, and should be referred to for details not included in this report.

The headquarters of the Marketing Officer were transferred to the Agricultural Department, St. Lucia, at the end of the year, for the remaining period of the appointment, and it is hoped that organisation of the local fruit trade will improve more rapidly with the personal supervision thus possible and the extension under the amended ordinance. The Soufrière Fruit Export

* E.M.B. 45, "Transport and Storage of Bananas with Special Reference to Chilling" by Wardlaw and McGuire (H.M. Stationery Office, 1/- net).

Co-operative Association is still inactive, no co-operation in setting up a communal packing scheme having been made, and estates still pack in isolated units, thus replicating all the details of their work. This expensive and obsolete method must be replaced by local co-operative packing and export, and be followed up by an organisation capable of conducting the Government Packing House. Thus an organisation would emerge capable of being affiliated to a West Indian Citrus Producers' Association, as projected by Mr. Stockdale, Agricultural Adviser to the Secretary of State, in his valuable report on West Indian agriculture*. It is only by such co-operation that permanent progress can be made and this development is definitely practicable and possible as shown by experience in Jamaica.

Cold Storage and Ice Factory.

The Cold Storage has been more freely used for pre-cooling of exports, and for local cold storage, a total revenue of £74 being shown for the year. Much more use should be made of the Cold Store for preserving truck crops and other perishable produce for later disposal during scarcity, and for ships stores. The Ice Factory manufactured 167 tons of ice and sold ice to the value of £379 during the year.

EXPORTS FROM ST. LUCIA, 1932.

	1931.			1932.		
	Quantities.	Value. £	£	Quantities.	Value. £	£
Sugar Products:—						
Sugar, Vacuum Pan tons ...	3,973	35,554		4,990	46,466	
Molasses & Syrup gall. ...	24,837	1,194	36,748	32,988	1,453	47,919
Cacao Products:—						
Cacao cwt. ...	10,419	14,125	14,125	8,188	9,091	9,091
Lime Products:—						
Concentrated Lime Juice gall. ...	10,312	650		7,280	78	
Raw Lime Juice ,, ...	6,961	297		4,069	152	
Distilled Lime Oil lb. ...	10,310	14,524		10,345	11,662	
Handpressed Lime Oil ,, ...	3,059	5,236		1,989	3,337	
Green Limes brl. ...	4,114	5,418	26,125	3,782	5,552	20,781
Coconut Products:—						
Coconuts No. ...	367,350	1,178		650,240	2,430	
Copra tons ...	498	5,869	7,047	432	5,389	7,819
Honey Products:—						
Honey lb. ...	38,314	308		46,393	331	
Beeswax ,, ...	643	20	328	392	12	343
Bay Products:—						
Bay Oil gall. ...	221	500		44	100	
Bay Rum ,, ...	5,579	1,043	1,543	1,428	276	376
Carried forward ...			85,916			86,329

* C.A.C. 128, "Report by Mr. F. A. Stockdale, C.M.G., C.B.E., Agricultural Adviser to the Secretary of State for the Colonies, on his Visit to the West Indies, Bermuda, British Guiana, and British Honduras, 1932" (Colonial Advisory Council of Agriculture and Animal Health, Colonial Office).

EXPORTS FROM ST. LUCIA—(*continued*).

		1931.			1932.		
		Quantities.	Value. £	£	Quantities.	Value. £	£
Brought forward	...	...		85,916	...		86,329
SPICES:—							
Nutmegs	lb. ...	6,486	99		5,872	79	
Mace	,, ...	1,131	54		1,064	48	
Kola Nuts	,, ...	9,907	77		17,389	110	
Miscellaneous	,, ...	1,389	16	246	2,623	29	266
VEGETABLE PRODUCTS:—							
Plantains	bchs.	184	16		203	16	
Farine	lb. ...	21,371	115		14,642	99	
Yams	,, ...	...	52		...	36	
Miscellaneous	...	...	...	183	...	416	567
FRESH FRUIT & PRODUCTS:—							
Bananas	bchs.	5,364	274		3,149	183	
Mangoes	...	...	2,172		...	1,655	
Oranges	No. ...	28,166	169		109,065	206	
Grapefruit	...	...	36		...	43	
Pineapples	...	...	23		...	96	
Avocado Pears	...	...	567		...	977	
Mixed Fruits	...	...	1,492		...	1,463	
Preserved Fruits,	...	...	...		...	...	
Jams, Jellies, &c.	...	...	66	4,799	...	133	4,756
FOREST PRODUCTS:—							
Boards (native)	c. ft. ...	543	50		1,009	73	
Cedar	,,	353	23		34	1	
Firewood	cords ...	1,066	466		845	338	
Logwood	tons ...	40	100		...	...	
Hardwood	c. ft. ...	368	31		2,430	222	
Brooms	doz. ...	1,345	44		1,384	53	
Charcoal	bags ...	39,803	2,031		79,960	4,042	
Furniture (Household)	...	...	...		...	685	
Miscellaneous	...	...	267	3,012	...	1	5,415
LIVE STOCK & PRODUCTS:—							
Cattle	No. ...	...	...		...	...	
Hides & Skins	,, ...	1,895	265		1,668	126	
Shells, Turtle	lb. ...	...	...		401	114	
Fish Oil	gall. ...	88	6		...	...	
Horses	No. ...	9	53		21	85	
Mules	,, ...	3	28		7	28	
Asses	,, ...	18	37	389	3	5	358
MISCELLANEOUS PRODUCTS	...		1,061	1,061		194	194
Total Exports	...			95,606			97,885

AGRICULTURAL OUTLOOK.

The partial recovery of the sugar market and improved prices for copra are the principal factors responsible for the increased value of exports during the year, the total values being £97,885 in 1932 as against £95,606 in 1931, despite the loss in lime juices and cacao values. The general trade position should now commence to improve, and the benefit to be derived from preferences will be more evident as prices become stabilised. Production has been maintained in all the more important industries, apart from natural losses due

to disease, and in some crops, e.g. sugar, coconuts, fruits, and vegetables, an increased production is already promised for the coming years.

The condition of smallholdings has been gradually improved, but this is very uphill work since many of the peasants are task-workers on larger estates and thus depend only partially on home-grown produce. The freedom with which cassava, breadfruit, yams and other ground provisions grow does nothing to emphasise the need for improvement in varieties and methods of cultivation; consequently the peasant cultivator follows the lead of the larger planter, and it is generally found necessary to demonstrate first to the middle-class planter in order that the lesson may work downwards. The easy prolificness of local provision crops is readily comprehended after visiting the drier neighbouring colonies.

It is with the middle class planter that most development is taking place, and here the new crop, grapefruit, supported by ground provisions and some vegetables, is rapidly extending. The large planters have reduced some of the cacao area, and this is also being replanted in grapefruit and limes.

Emigrant employment in the San Domingo cane fields has opened up temporary prospects mainly for the itinerant labourer, and fewer cultivators are now leaving their holdings as these are becoming more permanent and productive throughout the year.

External trade reports indicate that the period of severe depression has been overcome, and with the prospect of firmer markets owing to more normal stocks and greater purchasing power, the future appears sufficiently hopeful to warrant the anticipation of a more satisfactory trade balance at the end of the present crop season.

PEASANTS' DEVELOPMENT.

Advisory and demonstrational work among peasants occupied a large proportion of the time of the Agricultural Instructor and Agricultural Officer during the year, and their services were in constant demand. The following short notes on crops form a synopsis of peasants conditions and a record of progress made, with indications on future development.

Ground Provisions were cultivated extensively and at times production exceeded the demand. For fresh vegetables more use could be made of the Cold Storage and this is being urged when bulk crops are grown. The Windward coast has been well served by private motor buses and this has encouraged greater production. The Leeward coast is now benefited by a dual service of motor launches, with a consequent reduction in freight, and freer marketing.

Pulse crops, Onions and Garlic, were not cultivated sufficiently, and a relatively large importation of these was made, i.e. in 1931, Beans and peas, 337 cwt. at 2½d. per lb. (value £404 duty paid); Onions and Garlic, 825 cwt. at 2d. per lb. (value £862 duty paid). With better weather and the necessary willingness to adopt the right variety, it is hoped to substitute this by local production, which allows a very fair margin of profit; the necessary seeds and plants are therefore being supplied.

Vegetable sowings for export and local consumption were much hampered by wet weather during October–November, and planting has been delayed to the new year. The crops marketed locally during the summer were only of fair condition, and much improvement is needed for crops of good quality and yields. To meet this small demonstration plots are being laid out in the

Dennery and Soufrière districts for instructional purposes where peasants can be shown the advisory work carried out in practice under the Agricultural Officers. At such opportunities seeds and plants are distributed to the peasants, and followed by assistance in preparing the beds, drainage, and manures.

Peasants' Orchards Extension.

As indicated above, the smallholders are interested in fruit crops to the extent of replacing neglected cacao by citrus plants provided by the Department. In practically all cases this involves a complete clearance and rearrangement of beds and drains, and is carried out under the direction of an experienced officer. Orders of from 25 to 300 plants are dealt with and these are planted out with assistance from the travelling propagators. Numerous cases occur where free plants are expected and if these are not granted the extension is not carried out. In deserving cases where a genuine desire to plant exists and conditions are favourable, a free issue of plants is made with those already ordered and paid for. The price per plant, 3*d.* is merely nominal, and nothing is to be gained by indiscriminate issues which have subsequently to be cared for by the extension officers.

Topworking Fruit Trees.

This effort has progressed steadily throughout the year and is now less subject to weather conditions and is guaranteed to give a better recovery of topworked trees by the introduction of grafting on the method described under "Note on Graft Method".

No further trees are being cut back for the present, as attention is now concentrated on overhauling and repairing those already worked, in order to establish these as fruit-bearers. This involves considerable work, and a complete recheck of the trees treated since inception is now in progress. The following record is self-explanatory and is drawn from the weekly diary of this work :—

District.	Mangoes.					Citrus.					Avocados.
	Trees cut.	Trees Budded.	No. of buds put in.	No. of trees successful.	No. of buds successful.	Trees cut.	Trees Budded.	No. of buds put in	No of trees successful.	No. of buds successful.	Trees cut.
Gros Islet ...	...	10	14	2	2	...	...	...	...	...	...
Castries ...	275	774	2,009	321	647	12	70	95	50	63	6
Dennery ...	178	169	417	69	130	...	144	152	74	77	...
Micoud ...	...	16	57	14	31	...	30	30	8	8	...
Vieux-Fort ...	...	34	133	9	21	...	17	17	12	12	...
Laborie ...	...	114	265	66	132	...	84	84	28	28	...
Choiseul ...	...	590	1,158	276	521	1	238	260	164	181	...
Soufrière ...	290	616	1,650	243	427	16	513	675	325	417	...
Anse-la-Raye	...	173	389	74	122	...	55	75	33	43	...
Total 1932	743	2,496	6,092	1,074 (=43%)	2,033 (=33%)	29	1,151	1,388	694 (=60%)	829 (=59%)	6
1930-31 ...	5,995	4,581	11,338	2,859	5,110	258	583	817	405	451	15
Full total ...	6,738	7,077	17,430	3,933	7,143	287	1,734	2,205	1,099	1,280	21

Mangoes, 1932. Total successes 1,074 or 43%. Total buds successes 2,033 or 33·3%.
Citrus, 1932. ,, ,, 694 or 60%. ,, ,, ,, 829 or 59%.

Total trees under the Grant (including planters' trees budded, and not including approximately 500 trees as yet incompletely worked) = 8,811 worked, and 5,032 successes .....

Funds for this work will terminate in 1934.

AGRICULTURAL INSTRUCTION IN THE PRIMARY SCHOOLS.

Report of the Agricultural Superintendent on the Teaching of Agriculture in the Primary Schools of St. Lucia during 1932.

The twenty-fourth annual examination of the Primary Schools in Agriculture was conducted by the Agricultural Instructor between October 25th and November 29th. The number of pupils taught in the agricultural classes during the year was 702 as against 635 last year, or an increase of 10.5 per cent. as compared with a total of but 398 pupils in 1922, this is an increase of 76 per cent. during the last ten years. Of the above total, 170 pupils, or 24 per cent. of the number taught, were absent on examination days ; this is to be accounted for mainly by very wet weather, and the absences occurred chiefly in the outlying districts, Canaries, La Ressource and Saltibus. The classes include 97 girls in all from nine schools, and their work was very creditable as compared with that of the boys.

The theoretical work was generally good, and a better comprehension of principles is being shown by the classes. The practical work was more variable, but in the main satisfactory progress has been achieved.

The Mon Repos School and garden were destroyed by fire, therefore the results anticipated have been delayed. The Saltibus School has very generously been provided with a garden site by a local planter and the practical work here should now improve. The Soufrière School has fallen off badly in garden work, possibly through changes in Head Teachers, but this neglect should not be continued in such an important district. In general the school gardens suffer from the persistent disability of masters to reform the beds and plots as crops are removed, and worked out unsightly plants are the result. Thrown-out beds are commonly left bare and produce weeds, and so lose the hard-won tilth and humus so necessary in these plots. Green-dressings are freely available on request, and these should be regarded as a necessary rotation crop. Mulch and manure is constantly needed and every garden should build its manure heap, which should consist of decaying vegetable matter overlaid with soil.

In several school gardens, particularly the Castries R.C. Boys and Methodist, Micoud and Soufrière Schools, the sites are quite unsuited for garden work and only poor results can be expected. Suitable spots are available within easy reach of the class and it is urged that the Managers responsible could with their influence obtain the use of better sites where really useful work could be done. A good school garden is an asset in any district in St. Lucia, and with teaching and experience it enables the boys to become agriculturally minded and useful as gardeners and propagators.

The stress laid on raising and budding reliable varieties of orchard plants has resulted in a total of 511 improved citrus, avocados and mangoes propagated by schools during the year, and efforts should now be directed to the proper establishment of these for orchard work. No further stocks for budding should be raised, beyond the few needed for teaching purposes, and attention to the cultivation of better vegetables is needed in order to encourage production in the local small holdings. Free seeds can be obtained from this Department.

More interest in local crops with visits to estates is required of the classes, and the schools should coöperate in the Prize Holdings Competition to popularise this and remove the suspicion attaching to the free distribution of £150. The response to this competition during the year was too poor for any awards to be made.

The following schedule gives the distribution of plants propagated by the agricultural classes in 1932—(excluding vegetable seedlings):—

School.	Mangoes top-worked.	Mangoes grafted.	Oranges budded.	Grapefruit budded.	Limes budded.	Avocados grafted.	Pineapples.	Total.
Castries Anglican ...	...	15	28	...	...	...	...	43
Dennery R.C. Boys' ...	3	8	32	49	80	...	...	172
Castries R.C. Boys' ...	...	7	4	...	...	...	...	11
Riviere Dorée Anglican ...	1	7	27	19	24	...	...	78
Castries Methodist ...	...	4	2	2	...	...	...	8
La Ressource R.C. ...	7	6	14	3	...	...	...	30
Choiseul R.C. Boys' ...	...	5	8	...	...	...	...	13
Laborie R.C. Boys' ...	...	5	7	24	17	...	...	53
Anse-la-Raye Juvenile ...	1	7	8	6	...	...	24	46
Micoud R.C. Juvenile ...	...	11	1	...	...	2	...	14
Forestiere Methodist ...	...	...	7	5	...	...	...	12
Vieux-Fort R.C. ...	...	...	3	9	...	...	...	12
Mon Repos R.C. ...	5	...	9	11	...	...	...	25
Babonneau Juvenile ...	8	...	...	...	...	...	...	8
Saltibus R.C. Boys' ...	...	10	...	...	...	...	...	10
Canaries R.C. Juvenile ...	...	...	...	...	...	...	...	...
Soufrière R.C. ...	...	...	...	...	...	...	...	...
Total ...	25	85	150	128	121	2	24	535

E. A. WALTERS,
Agricultural Superintendent.

EXAMINER'S REPORT.

Castries Anglican Juvenile.

The theoretical knowledge was very satisfactory in this class. In spite of the heavy rains at the time of examination the garden itself was well established with a collection of vegetables such as beet, cabbage, leek, carrot and salad beans. The beds are laid out in the right direction, but the drains should be deepened and the walks lifted to prevent severe washing on the slopes during wet weather.

Dennery R.C. Boys' Juvenile.

This school garden is properly worked and is serving a very useful purpose. Besides vegetable cultivation a large number of budded and grafted fruit trees has been raised and distributed to planters and pupils of the agricultural class.

Heavy mulching and manuring have been used during the dry weather. This accounts largely for the good results obtained and should not be neglected. More gliricidia should be planted and allowed to grow tall to provide shade which is very necessary; and the garden beds should be shifted when reforming the garden. The theoretical work was very satisfactory.

Castries R.C. Boys' Juvenile.

This school presented a large class of boys and their theoretical knowledge was very good. The practical work in the small and unsuitable garden was carried out under great difficulties. Good crops of cabbage, lettuce and other vegetables were raised in boxes, but the small plot was badly washed by heavy rains. The Revd. Manager is trying to secure a better site for the garden.

Riviere Doree Anglican Juvenile.

The theoretical knowledge was good. The soil seems suited to the raising of budded citrus and during the last two years a number of healthy budded oranges and grapefruit has been grown and distributed. This effort should now be limited, and more attention be given to the raising of vegetables such as onions, tomatoes, cabbage, melons, and beans.

As the soil is poor the beds should now be reformed and incorporated with manure which is easily obtained here. Bush and grass should be cut from the Rectory lands and applied heavily as mulch during the dry season, and the gliricidia hedge on the northern and western sides should be allowed to grow tall to serve as shade.

Castries Methodist Juvenile.

The theoretical knowledge here is very good and the boys are keen on their work. The garden plot is too small but good results are being secured in the cramped space. The crops consisted of yams, eddoes, peppers, tomatoes, cabbage, onions and other vegetables, which though in small quantities, were giving good returns.

La Ressource Combined.

In this school the improvement noted in the theoretical work last year has been kept up. The soil of the new garden is heavy and requires large quantities of pen manure and heavy mulching to improve the texture. The beds should not be allowed to become bare and baked during the dry weather, and shade trees should also be planted. Good crops of yams, melons, cabbage and other vegetables have been grown, but owing to an outbreak of scab on the sour orange stocks, the distribution of budded citrus was very small.

Choiseul R.C. Boys' Juvenile.

This garden has been enlarged and is fairly well cropped with vegetables. The soil is poor and stable manure not easily obtained. Consequently lemon grass should be maintained on the waste lands around the garden and cut as mulch for the dry season. Some of the gliricidia trees around the garden should also be allowed to grow tall to serve as shade. Onions and beans could be usefully included in the vegetable crops. The theoretical knowledge of the pupils was satisfactory.

Laborie R.C. Boys'.

The theoretical knowledge is satisfactory. The pupils have acted on the remarks made last year, and a number of budded citrus (grapefruit and oranges) have been grown and distributed to the boys of the agricultural class for planting at home. The soil of this garden is poor and needs a large quantity of humus which, as stable manure is scarce, should be obtained by liberal dressings of dry grass and compost as mulch.

Anse-la-Raye R.C. Juvenile.

The theoretical knowledge at this school, especially the girls, was good. The garden has been flooded frequently this year, but now that the river wall has been built it is to be hoped that a little more permanent work will be done. The crops consisted of pineapples, tomatoes, beans, cabbage and other vegetables which were giving good results.

Micoud R.C. Juvenile.

The garden is a small, sandy plot unsuitable for cultivation. A large quantity of stable manure has been dug in during the year and this has enabled good crops of eggplants, tomatoes, papaws, and melons to be grown, but until a more suitable garden is found, practical work profitably to accommodate the class cannot be done. The theoretical work was very good.

Forestiere Methodist Combined.

The theoretical knowledge was satisfactory and the garden was cropped with garlic, onions, cabbage, yams and other vegetables grown in a very efficient manner. The land is poor but responds readily to stable manure, the making of which could be easily increased by growing lemon grass for stable litter on the adjacent waste lands.

Vieux-Fort Boys' Juvenile.

The theoretical knowledge was good and the boys seem to be taking more interest in their work. An attempt is being made to establish a few permanent fruit trees in the land around the school, and this should be useful. The new garden plot in the Town is sandy, but can grow useful vegetable crops if shaded and heavily mulched.

Mon Repos R.C. Juvenile.

This school garden suffered a good deal from the fire which destroyed the school on April 2nd, and it was not properly re-established until late in the year. The garden soil is poor and deficient in humus, but grass and straw can be easily obtained from waste lands around the school and this should be spread heavily on the lands and could be worked in later on. More gliricidia should be planted around the garden and should be allowed to grow tall for shade. An orchard of about 12 grafted "Julie" mangoes should be established in the available lands around the school. The theoretical knowledge was fair especially the girls.

Babonneau R.C. Juvenile.

The pupils of the agricultural class of this school are very keen and the answers

to the theoretical questions were good. The school has been removed to a new site and there has been a change of Head Teachers. A new garden has now been made from grass land. There is a quantity of mulch available which should be taken full advantage of for green mulching and manure; and the gliricidia hedge around the garden should be allowed to grow tall to serve as shade.

SALTIBUS R.C. JUVENILE.

A large and suitable piece of land has been given to this school by a neighbouring planter for school garden purposes and should prove of great benefit to the pupils. It requires draining and as stable manure is not available a large compost heap should be maintained for mulching and supplying humus. Crops of onions, garlic, beans and tomatoes should be included in the cultivation. The theoretical knowledge of the pupils shows improvement.

CANARIES R.C. JUVENILE.

There has been a little improvement in the practical work of this school garden, but there is room for still better results. Beds of onions, carrot, eggfruit, beans and tomatoes for local use should be included in the garden. The soil is easily worked and should give good results. The theoretical knowledge of the pupils was satisfactory.

SOUFRIERE BOYS' JUVENILE.

Agriculture in this school was very disappointing this year. There has been a change of Head Teachers during the year and from its results the agricultural class must have been neglected. Even the VIth Standard pupils were out of touch with what they knew when in the lower classes. The soil of this garden is sandy but could be improved by working in large quantities of stable manure which is easily obtained, and a few tall trees should be grown at the side of the wall running parallel with the street to shade the garden. The theoretical work was very unsatisfactory, but it is to be hoped that the new master will improve conditions generally.

List of Marks and Standing of Schools in Agricultural Teaching.

School.	No. of Pupils examined.	Condition and use made of garden.	Practical work and knowledge.	Theoretical knowledge.	Total.	Percentage.	Result Note.
Possible Marks	—	10	10	10	30	100	—
Castries Anglican Juvenile	44(a)	10	9	9	28	93·3	E.
Dennery R.C. Boys' Juvenile ...	26	10	10	8	28	93·3	E.
Castries R.C. Boys' Juvenile ...	98	8	9	10	27	90·0	E.
Riviere Dorée Anglican	14(b)	9	10	8	27	90·0	E.
Castries Methodist Juvenile	23	8	9	10	27	90·0	E.
La Ressource R.C. Combined ..	11(c)	9	10	8	27	90·0	E.
Choiseul R.C. Boys' Juvenile ...	59	9	8	9	26	86·6	V.G.
Laborie R.C. Boys' Juvenile ...	33	8	9	8	25	83·3	V.G.
Anse-la-Raye R.C. Juvenile	20(d)	7	8	9	24	80·0	V.G.
Micoud R.C. Juvenile	14	7	7	10	24	80·0	V.G.
Forestiere Methodist	8(e)	9	8	7	24	80·0	V.G.
Vieux-Fort R.C. Boys' Juvenile ...	30	7	7	9	23	76·6	V.G.
Mon Repos R.C. Juvenile	10(f)	7	7	8	22	73·3	G.
Babonneau R.C. Juvenile	28(g)	8	6	8	22	73·3	G.
Saltibus R.C. Juvenile	26(h)	7	8	7	22	73·3	G.
Canaries R.C. Juvenile	17(i)	7	7	8	22	73·3	G.
Soufrière R.C. Boys' Juvenile ...	71	5	5	7	17	56·6	G.

(a) including 20 girls; (b) 6 girls; (c) 4 girls; (d) 13 girls; (e) 5 girls; (f) 6 girls; (g) 20 girls; (h) 14 girls; (i) 9 girls;

R. W. NILES,
Examiner.

ADMINISTRATION.

REPORT ON THE WORKING OF THE REUNION ESTATE AND LAND SETTLEMENT.

Land Settlement:—Of the 46 lots comprising the Reunion Land Settlement, 42 have completed payments, making a total sum of £943 15 11. Instalments on the remaining four lots were very difficult to collect.

Choiseul Village Extension:—No more lots were taken up, and nineteen lots remain unsold.

The total revenue derived was as follows:—

Instalments on Land Settlement	£5	4	4
Instalments on Village Extension		8	0
House Lots and Land Rents	1	9	0
	£7	1	4

CORRESPONDENCE AND DISTRIBUTION OF INFORMATION ON AGRICULTURAL MATTERS.

One hundred and forty-four Minute Papers and one thousand two hundred and eleven letters were dealt with during the year; information was supplied and official returns rendered for the Blue Book, the Advisory Department of the Imperial College of Tropical Agriculture, the Imperial Agricultural Bureaux, the Imperial Institute, the International Institute of Agriculture (Rome), and miscellaneous overseas enquirers.

Several reports and publications which were presented to the Library are gratefully acknowledged.

EXPENDITURE AND REVENUE.

Expenditure.

Personal Emoluments	£1,511	0	8
Travelling Allowance to Agricultural Superintendent	99	14	5
Travelling Allowance to Assistant Agricultural Superintendent ...	36	6	4
Travelling Allowance to Agricultural Instructor	120	0	0
Travelling Allowance to Agricultural Officer	50	0	0
Transport Allowance for Visiting Officers of the Imperial Department of Agriculture	3	3	6
Labour, Union and Castries Stations	402	18	10
Seeds, Plants and Manures	54	4	8
Transport and Animals	6	12	2
Miscellaneous Requisites	19	4	10
Printing, including Publicity Work and Purchase of Books ...	4	2	5
Minor Repairs to Buildings, Union and Castries	8	9	10
Freight and Transport of Plants	4	9	9
Contingencies, including expenditure on plant disease	9	4	0
Demonstration Fruit and Vegetable Plot	45	7	10
Experimental Lime Plot at Union Station	99	9	5
Ornamental Plants for C.N. Steamers	3	1	2
Agricultural Cadets	83	10	6
	£2,561	0	4

Revenue.

Head IV. 17.	Fees for Fruit Inspection	£47	14	0
20.	Sales from Agricultural Stations	133	19	8
X. 1.	Land Settlements, Rents	7	1	4
		£188	15	0

OFFICIAL VISITORS TO THE STATIONS.

His Excellency Sir Thomas Alexander Vans Best, K.C.M.G., K.B.E., Governor and Commander-in-Chief of the Windward Islands, and Mrs. Peter Best; His Honour C. W. Doorly, C.B.E., Administrator, and Mrs. Doorly;

Hon. Captain T. G. R. Wade, M.A., B.Sc., (Econ.), F.R.G.S., Inspector of Schools, and Mrs. Wade; Mr. A. C. Shill, M.Sc., A.R.C.S., D.I.C., A.I.C., Marketing Officer; Mr. F. A. Stockdale, C.M.G., C.B.E., Agricultural Adviser to the Secretary of State for the Colonies; Professor H. A. Ballou, M.Sc., Commissioner of Agriculture; Mr. G. Jones, Dip. Agric., Assistant Commissioner of Agriculture.

There was a large number of other visitors to the Stations during the year.

STAFF CHANGES.

Mr. E. A. Walters, F.R.H.S., F.R.M.S., Agricultural Superintendent, was absent on vacation leave from 23rd April to 17th November. During his absence Mr. A. F. Nichols, Dip. Agric. (I.C.T.A.), A.I.C.T.A., Assistant Agricultural Superintendent, acted as Agricultural Superintendent in conjunction with his substantive duties.

Mr. Nichols was on sick leave from 3rd to 28th March and from 6th to 8th December; and on vacation leave from 29th October to 4th November and from 9th to 19th December.

Mr. R. W. Niles, Agricultural Instructor, was on sick leave from 9th to 12th March.

Mr. R. du Boulay, Clerk to Agricultural Superintendent was transferred to the post of Clerk, III District Court, and Mr. W. H. French was transferred from this post to the office of Clerk to Agricultural Superintendent.

Mr. S. Joseph, Plant Inspector, had one month sick leave. His services were dispensed with on the 30th September.

Mr. George Hinds, Plant Inspector, was on vacation leave from the 27th December to the 31st December.

Mr. W. Arthur Lewis, Copyist, continued on vacation leave from the 1st to the 15th January.

Mr. J. R. L. Johnson, Manager, Government Marketing Depot, was on vacation leave from the 25th June to 9th July.

METEOROLOGICAL OBSERVATIONS.—APPENDIX I.

STATION, CASTRIES, ST. LUCIA, B.W.I.

LONGITUDE=60° 59′ 49″ W. LATITUDE=14° 0′ 36″ N. HEIGHT ABOVE MEAN SEA LEVEL=10ft.

Month.	Air Temperature.				Absolute Max. and Min.				Relative Humidity % (Glaisher's factor.)		
	7 a.m.	12 noon	5 p.m.	Mean	Max.	Date	Min.	Date.	7 a.m.	12 noon	5 p.m.
January ...	77·2	84·2	79·2	80·2	89	1st	66	25th	86	63	76
February ...	72·6	82·6	79·0	78·1	86	1st	62	15th	89	64	81
March ...	76·5	82·9	78·3	79·2	89	15th	62	12th	80	59	77
April ...	77·3	85·6	78·9	80·6	91	23rd	63	28th	87	62	77
May ...	78·3	86·8	79·1	83·4	92	18th	60	2nd	83	61	80
June ...	78·6	85·3	78·7	80·9	91	3rd	69	27th	83	66	81
July ...	78·1	86·3	79·1	81·2	91	16th	65	23rd	84	61	80
August ...	79·1	87·0	79·5	81·9	91	24th	69	29th	80	62	77
September	78·5	87·5	79·5	81·8	92	23rd	69	22nd	82	61	80
October ...	77·6	85·4	78·9	80·6	92	24th	67	13th	88	67	84
November	76·7	84·3	78·1	79·7	92	1st	64	26th	89	87	83
December ...	73·6	83·9	78·4	78·6	87	7th	60	28th	91	63	85
Year ...	77·0	85·2	78·9	80·5	92	1st Nov.	60	28th Dec.	87	65	80

APPENDIX II.

ht.=3′ 0″ *hr.*=1′ 0″. STATION CASTRIES.

Month.	Rainfall (inches)			Weather.		Wind. No. of Observations of. (at 7 a.m., 12 noon & 5 p.m.)								
	Total	Max.	Date	Days of Rain	Days of Gales.	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calm
January ...	3·43	0·67	26th	17	0	0	0	43	36	0	3	5	0	6
February	2·83	0·37	27th	15	0	0	0	62	12	0	0	0	0	13
March ...	4·71	1·49	1st	17	0	0	0	87	6	0	0	0	0	0
April ...	4·27	0·87	27th	19	0	0	0	78	5	0	0	0	0	7
May ...	8·01	1·63	2nd	18	0	0	0	70	17	0	0	0	0	6
June ...	12·64	2·64	16th	25	0	0	0	83	5	0	0	0	0	2
July ...	8·70	0·98	21st	26	0	0	0	78	6	0	0	0	0	9
August ...	5·73	1·42	29th	21	0	0	0	70	10	0	0	1	0	12
September	8·30	2·36	11th	20	0	0	0	60	6	0	0	7	0	17
October ...	11·92	2·65	2nd	20	0	0	0	56	3	0	0	0	0	34
November	25·16	3·27	18th	26	0	0	0	49	9	0	0	0	0	32
December	7.47	1·77	3rd	20	0	0	0	77	6	0	0	0	0	10
Year ...	103·17	3·27	18th Nov.	244	0	0	0	813	121	0	3	13	0	148

ht.=Height of therm. above the ground in feet.
hr.=Height of the rainguage above the ground in feet.

MEMORANDUM ON METEOROLOGICAL CONDITIONS DURING THE YEAR 1932, SAINT LUCIA, B.W.I.

Rainfall: The rainfall recorded at the Botanic Gardens, Castries, for the year 1932 was 103.17 inches. This was 2.09 inches above that for the previous year, which was severely wet, and 12.28 inches above the average rainfall for 43 years (1890—1932), the average now being 90.89 inches per annum. Maximum precipitation for Castries occurred on November 18th, when 3.27 inches fell. Maximum precipitation registered for the Colony was 5.20 on the same date, when heavy rains fell throughout the Colony, the heaviest fall being in the driest district. The rainfall generally was severe and not well distributed, particularly in June and November, which were unusually wet months ; a dry period occurred unexpectedly in August and was responsible for some loss of newly planted crops. Conversely this was of considerable benefit to the young pods in the cacao crop then forming. The distribution of rain throughout the Colony was also unusual, the drier areas receiving as much as the wet districts.

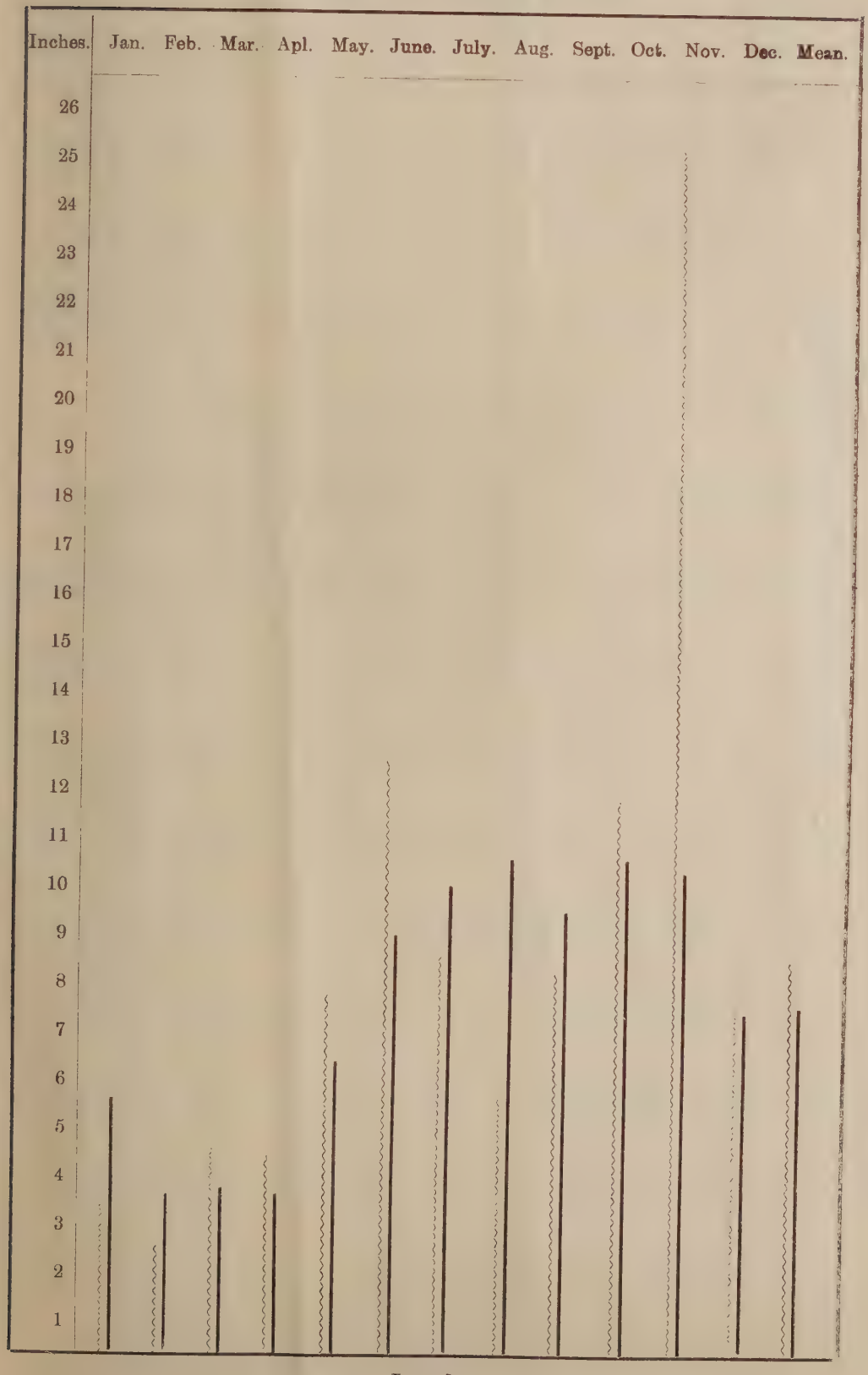
Temperature : Temperature records at the Botanic Gardens, Castries, show a mean noon temperature of 85.2° in the shade. The maximum temperature was 92° ; the minimum temperature was 60°, an exceptionally high range of 32°. Day and night temperatures were generally lower than usual during the true dry season February to May, and again in November to December. The relative humidity was higher than usual, particularly in November, when hurricane conditions were forming.

Weather : The weather generally was wet and cool, with few storms. The hurricanes of June (Porto Rico) and November (Jamaica and Cuba) were not felt in the Colony.

Stations : The number of stations recording during the year was 38. The Agricultural Superintendent desires to thank recorders for their cooperation, and to emphasise the importance of an accurate daily record as the only means of obtaining definite information on weather conditions as governing agriculture.

APPENDIX III.

AVERAGE MONTHLY RAINFALL—43 YEARS (1890–1932) CASTRIES, ST. LUCIA, B.W.I.



Legend.

Average for 43 years.

Rainfall during 1932.

APPENDIX IV.

RAINFALL RETURNS, 1932.

Observation Stations.	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.	Total.	Maximum in one day and date.		No. of days of rain.
	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.	Ins.		
Gros Islet, Reduit Estate	...	...	...	...	...	7·85	8·01	5·56	9·54	10·10	18·07	4·23	63·36*	3·02	Nov. 18th	145
Castries, Corinth	3·66	3·16	4·43	3·25	7·10	9·75	10·12	5·84	9·58	11·49	21·89	4·66	94·93	3·00	June 16th	206
Marquis Estate ...	2·05	3·15	5·59	3·12	6·93	9·89	7·75	3·93	10·05	11·58	24·13	5·45	93·62	3·22	Nov. 6th	226
Union	2·68	3·07	5·01	4·40	7·21	10·80	8·69	6·52	11·35	10·43	23·69	6·25	100·10	3·08	June 16th	234
Choc Estate ...	1·96	3·11	3·72	2·60	6·42	8·51	7·87	5·63	7·95	9·20	17·94	4·30	79·21	2·43	,, 16th	207
Botanic Gardens ...	3·43	2·83	4·71	4·27	8·01	12·64	8·70	5·73	8·30	11·92	25·16	7·47	103·17	3·27	Nov. 18th	244
The Barracks, Vigie ..	3·96	3·44	2·86	3·69	6·86	12·40	8·61	5·65	6·49	9·01	16·34	4·70	84·01	3·25	June 16th	210
Soucis Est. Cul-de-Sac	4·24	2·71	3·20	4·97	5·74	11·52	8·00	6·60	5·76	11·32	16·41	5·61	86·08	2·74	Oct. 3rd	230
Crown Lands Est. ,,	6·53	4·22	5·92	4·02	7·38	12·85	10·30	8·10	10·27	11·75	35·90	11·34	128·58	3·20	Nov 2 & 22	273
La Perle Est., Roseau	4·24	3·09	3·07	4·07	3·01	10·35	8·49	5·46	9·58	10·88	9·85	6·49	78 58	3·35	June 16th	181
Belair Estate, ,, ...	4·49	1·69	3·97	2·28	2·46	9·71	8·17	5·86	8·18	10·60	16·46	6·55	80·42	3·06	.. 16th	209
Vanard .. ,, ...	6·26	3·06	5·71	3·71	5·11	13·11	10·00	6·85	10·42	13·48	19·06	7·34	104·11	3·70	Oct. 2nd	151
Roseau .. ,, ...	2·63	1·35	1·57	2·28	3·15	11·76	7·81	5·75	6·18	10·65	12·41	4·87	80·41	3·50	June 16th	170
Ravine Poisson, Estate	...	4·02	7·50	3·77	5·81	11·84	9·05	8·08	12·38	13·21	24·32	7·92	107·90*	2·79	Oct. 26th	126
Soufrière, La Perle Estate	6·05	2·29	1·87	3·50	7·76	14·05	8·99	7·14	6·87	10·24	15·54	7·90	92·20	2·30	June 16th	241
Ruby Estate ...	5·92	2·33	1·55	2·79	7·45	11·53	11·86	8·45	7·22	11·17	16·52	10·00	96·79	2·40	Oct. 2nd	193
La Dauphine Estate ...	4·55	1·68	1·95	2·72	8·35	12·75	10·56	5·96	6·17	14·33	14·29	7·48	90·79	2·43	Dec. 2nd	234
Union Vale ,, ...	3·99	1·60	1·56	2·69	6·93	12·19	8·81	6·11	6·24	12·16	14·50	7·18	83·96	2 53	,, 2nd	225
Beausejour ,, ...	6·89	3·16	2·77	3·98	10·49	15·93	12·74	8·15	10·04	18·39	18·57	9·59	120·70	2·84	,, 2nd	298
Belle Plaine ..	7·97	2·57	2·93	4·43	9·83	15·79	13·07	8·88	7·60	18·27	19·56	10·09	120·99	2·98	June 16th	278
Choiseul, Morne Lezard Est.	6·04	2·11	3·22	4·32	7·84	10·87	8·81	6·83	6·43	17·99	18·24	7·26	99·96	3·32	Nov. 18th	241
Park Estate ...	6·88	3·76	3·41	5·09	9·16	12·58	9·77	7·77	7·43	18·96	22·12	8·79	115·72	3·85	,, 18th	264
Woodlands Estate ...	8·49	4·35	5·34	7·20	8·28	13·71	12·23	9·24	9·06	19·61	18·88	10·40	126·79	3·56	.. 18th	278
Laborie, Londonderry Est.	5·73	2·35	3·87	4·30	7·94	11·34	7·89	6·44	6·87	16·00	19·89	6·75	99·37	3·15	,, 18th	250
Giraud Estate ...	6·55	2·59	3·01	4·50	7·51	13·22	9·73	8·02	7·66	17·38	22·19	7·91	110·27	4·00	,, 18th	217
Black Bay Estate ...	2·60	2 40	3·30	3·45	6·10	10·50	6·95	4·50	5·80	12·55	13·25	6·52	77·92	2·20	Oct. 16th & Nov. 19th	157
Vieux-Fort, Retraite Est.	3·17	3·14	4·08	3·38	6·38	9·59	6·83	4·96	8·61	13·61	16·65	7·58	87.98	3·40	Oct. 15th	172
Moule-à-Chique Estate	1·99	1·50	2·08	2·45	3·05	8·31	3·63	2·62	2·33	11·62	9·63	4·76	53·97	4·55	,, 16th	183
Beausejour Estate ...	2·62	2·65	2·47	3·24	5·34	9·85	5·40	3·79	6·12	13·35	15·23	7·17	77·23	2·71	Nov. 6th	166
Pointe Sable	2·77	2·20	4·26	2·99	4·60	11·19	4·67	3·15	4·42	14·03	14·73	6·33	75·34	3·12	June 16th	157
Micoud, Troumassée Est.	3·37	0.25	7·90	3·74	1·90	7·34	6·77	7·88	8·04	16·78	21·24	5·34	90·55	5·20	Nov. 18th	87
Dennery, Mamiku Estate	2·66	2·52	5 20	3·39	2·91	7·22	6·41	3·33	9·82	11·84	16·69	5 62	77·61	2·22	Sep. 11th	278
Errard Estate ...	...	...	...	...	...	9·87	9·48	4·66	11·09	13·66	24·17	...	72·93*	2·98	Nov. 19th	164
Prospect ,, ..	4·65	3·63	6·23	4·25	3·82	10·26	8·99	5·22	12·90	14·77	26·31	7·47	108·50	3·10	Sep. 11th	293
La Cayé ,, ...	2·00	..	...	4·57	4·13	10·58	6·84	4·62	...	...	...	...	32·74*	2·67	June 16th	78
Ressource ,, ..	3·07	...	4·91	3·42	4·05	8·34	6·83	4·35	...	...	...	...	34·97*	1·97	,, 16th	104
Richfond , ...	3·33	...	5·77	3 30	4·28	8·93	7·12	4·13	...	...	...	...	36·86*	2·50	July 21st	102
Border ,, ...	4·47	4·15	7·94	2·70	3·27	10·15	9·08	6·01	13·20	15·46	22·63	7·70	106·76	3·85	Mch. 26th	253

* Record is not complete.

Mont D'Or Estate, Roseau, submitted no records during the year.

E. A. WALTERS, *Agricultural Superintendent.*

GRAPH of RAINFALL of the BOTANIC GARDENS, Castries during the period 1890—1932.

REVISED PRICES OF NURSREY PLANTS, ETC.

The prices of plants do not include the cost of the box or baskets, for which a charge will be made, if not returned to the Department.

All prices specified are for plants of standard quality. The prices of plants not included in this list will be fixed by the Agricultural Superintendent.

When nutmegs are supplied by the owner for grafting, a charge of 3d will be made for each plant on delivery.

An addition of 100% is made on the price of all plants supplied for export from the Colony.

No plants are supplied on Public Holidays.

At least six months previous notice must be given when large quantities of such plants as coffee, cacao, nutmegs, citrus, cane plants, etc., are required, as it is not feasible to keep large supplies of these on hand. At least six months notice is required for large supplies of budded citrus, the sour stock for which have to be specially propagated.

Complaints as to the quality or quantity of plants, etc., supplies, or as to the prices charged, should be made in writing to the Agricultural Superintendent.

PLANTS.

Oranges Budded	3d. per plant.
Oranges Sour	6d. per hundred.
Grapefruit Budded	3d. per plant.
Lime Plants (Seedlings)	1/- per hundred.
Lime Plants Budded/Grafted	2d. to 4d. per plant.
Mangoes Budded/Grafted	6d. to 1/- per plant.
Coffee Plants	1/- to 2/- per hundred.
Cacao Budded	2d. per plant.
Nutmegs Grafted	6d. to 9d. per plant.
Avocado Pear	2d. to 3d. per plant.
Avocado Grafted	2d. to 3d. per plant.
Cane Plants	1/- per hundred.
Pineapple Plants	1d. to 3d. per plant.
Guava Plants	1d. per plant.
Eucalyptus	2/- per hundred.
Casuarina	2/- per hundred.
Palms (various)	3d. per plant.
Ornamental Plants (various)	2d. to 1/- per plant.
Seeds (various)	2d. to 6d. per packet.
Seeds (vegetable)	2d. to 3d. per packet.
Plants for windbreaks, hedges, etc., other than the above mentioned	2/- per hundred.

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